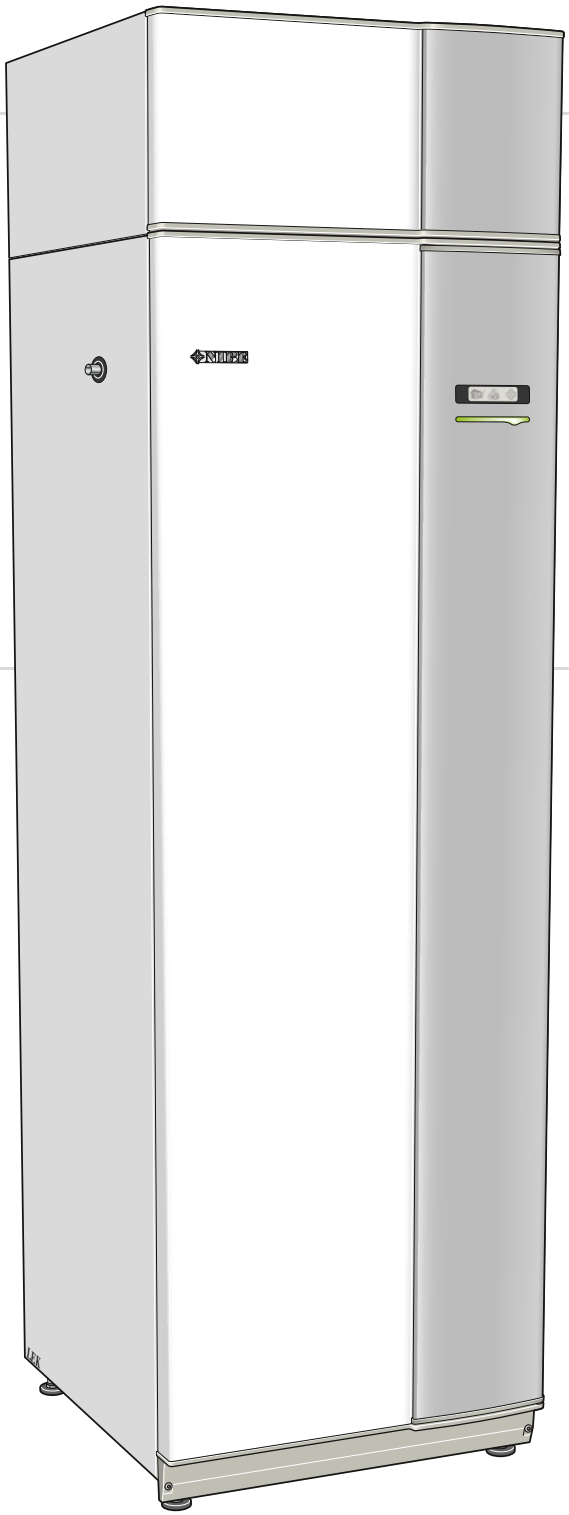


Installer manual

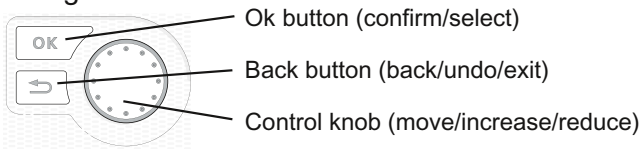
NIBE™ F470

Exhaust air heat pump

IHB GB 1338-1
231494

Quick guide

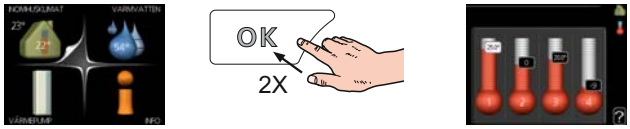
Navigation



A detailed explanation of the button functions can be found on page 30.

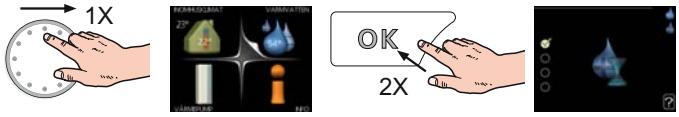
How to scroll through menus and make different settings is described on page 32.

Set the indoor climate



The mode for setting the indoor temperature is reached, when in the start mode in the main menu, by pressing the OK button twice. Read more about the settings on page 34.

Increase hot water volume



To temporarily increase the amount of hot water, first turn the control knob to mark menu 2 (water droplet) and then press the OK button twice. Read more about the settings on page 41.

In event of disturbances in comfort

If a disturbance in comfort of any type occurs there are some measures that can be taken before you need to contact your installer. See page 56 for instructions.

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1 Important information

Safety information

This manual describes installation and service procedures for implementation by specialists.

This appliance can be used by children aged from 8 years and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning use of the appliance in a safe way and understand the hazards involved. Children shall not play with the appliance. Cleaning and user maintenance shall not be made by children without supervision.

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Symbols

NOTE
This symbol indicates danger to machine or person.

Caution
This symbol indicates important information about what you should observe when maintaining your installation.

TIP
This symbol indicates tips on how to facilitate using the product.

Marking

F470 is CE marked and fulfils IP21.

The CE marking means that NIBE ensures that the product meets all regulations that are placed on it based on relevant EU directives. The CE mark is obligatory for most products sold in the EU, regardless where they are made.

IP21 means that the product can be touched by hand, that objects with a diameter larger than or equivalent to 12.5 mm cannot penetrate and cause damage and that the product is protected against vertically falling drops.

Handling

The heat pump contains highly flammable refrigerant. Special care should be exercised during handling, installation, service, cleaning and scrapping to avoid damage to the refrigerant system and in doing so reduce the risk of leakage.

NOTE
Work on the refrigerant system must be done by authorised personnel in accordance with the relevant legislation on refrigerants, supplemented by additional requirements for flammable gas, for example, product knowledge as well as service instruction on gas systems with flammable gases.

Safety precautions

Wiring

Check that cabling will not be subject to wear, corrosion, excessive pressure, vibration, sharp edges or any other adverse environmental effects. The check shall also take into account the effects of aging or continual vibration from sources such as compressors or fans.

Repairing sealed components

When repairing sealed components, all electrical supply must be disconnected from the equipment that is being repaired before any sealed covers or similar are removed. If it is absolutely necessary to have an electricity supply to the equipment during the service, continuously activated leak tracing must be performed at the most critical points in order to warn of any dangerous situations.

Pay particular attention to the following so that the sheath is not changed in a way that affects the protection level when working with electrical components. This means damage to cables, unnecessary amounts of connections, terminals that do not follow the original specifications, damaged gaskets, incorrect grommets etc.

Ensure that the apparatus is secured properly.

Check that seals or sealing materials have not deteriorated to a degree that they can no longer prevent combustible gases from entering. Replacement parts must meet the manufacturer's specifications.

NOTE! Use of silicone seals can hamper the efficiency of certain types of leak tracing equipment. Components with built in safety do not need to be isolated before starting work.

When working in the refrigerant circuit

Pipe installation should be kept to a minimum.

Connections in the refrigerant circuit must be carried out as follows:

- Soldered, welded or mechanical connections must be made before the valves are opened to allow the refrigerant to flow between the cooling system parts. The system must be equipped with a vacuum valve to relieve connecting pipes and/or any unfilled parts of the cooling system.
- Reusable mechanical connectors and collared joints are not permitted indoors.
- Refrigerant pipes must be protected or recessed to prevent damage.
- Must be accessible for future maintenance.

National gas regulations must be observed.

Maximum amount of refrigerant: See Technical specifications.

- Everyone who works with or opens a refrigerant circuit must have a current, valid certificate from an accredited industry issuing body, which states that, according to the industry's recognised assessment standard, they have the authority to safely handle refrigerants.
- Servicing must only be performed according to the equipment manufacturer's recommendations.

Maintenance and repairs that require the assistance of another trained person must be carried out under the supervision of person with the authority to handle combustible refrigerants.

Maintenance and repair that requires the skill of another person must be carried out under the supervision of someone with the above expertise.

Before work is started on systems that contains combustible refrigerants, safety checks must be performed to ensure that the ignition risk is kept to a minimum.

The work must be carried out in a controlled way to minimise the risk of contact with combustible gas or liquid during the work.

All maintenance staff and those who work in close proximity to the product must be instructed which type of work is to be carried out. Avoid carrying out work in enclosed spaces. The area surrounding the worksite must be cordoned off. Ensure that the area is made safe by removing combustible material.

Check whether there is refrigerant in the area using a suitable refrigerant detector prior to and during work, to notify the service technician whether there is a possible flammable atmosphere or not. Ensure that the refrigerant detector is suitable for combustible refrigerant, i.e. does not generate sparks or cause ignition in any other way.

If hot work is carried out on the heat pump, a powder or carbon dioxide fire extinguisher must be to hand.

Those who carry out work with refrigerant system connections, including exposing pipes that contain or have contained combustible refrigerant, may not use potential ignition sources in such a way that that can lead to risks of fire or explosions.

All potential ignition sources, including cigarette smoking, should be kept at a safe distance from the service work area where combustible refrigerant can leak out. Before carrying out work, the area surrounding the equipment must be checked to ensure that there are no ignition risks. "No smoking" signs must be displayed.

Ensure that the work is carried out outdoors or that the work area is ventilated before the system is opened and before any hot work is carried out. The area must be ventilated whilst the work is being carried out. There must be ventilation around any refrigerant that comes out, which should be routed outdoors.

If electrical components are replaced, the replacement parts must be fit for purpose and have the correct technical specifications. Always follow the manufacturer's guidelines regarding maintenance and servicing. Contact the manufacturer's technical department in the event of any doubts.

The following checks must be carried out for installations that use combustible refrigerants.

- The filling quantity is appropriate for the size of the space where the parts that contain refrigerant are installed.
- Ventilation equipment and outlet work correctly and without obstructions.
- If an indirect refrigerant circuit is used, check whether the secondary circuit contains refrigerant.
- All markings of equipment are visible and clear. Markings, signs and similar that are not clear must be replaced.
- Refrigerant pipes and components are positioned in such a way that it is not likely that they be subjected to substances that can corrode components containing refrigerant, if these components are not made of material that is resistant against corrosion, or not appropriately protected against such corrosion.

Repair and maintenance of electrical components must include initial safety checks and procedures for component inspection. In the event of a fault, which can cause a safety risk, do not supply any power to the circuit until the fault has been rectified. If the fault cannot be rectified immediately, and operation must continue, an adequate temporary solution must be implemented. This must be reported to the equipment owner, so that all parties have been informed.

The following checks must be carried out at the initial safety checks.

- That the capacitors are discharged. Discharging must be done safely, to prevent the risk of sparking.
- That no powered electrical components or live cables are exposed when filling or collecting refrigerant or when the system is flushed.
- That the system is continually grounded.

Removal and draining

When a cooling circuit is opened for repairs – or for another reason– work must be carried out in a conventional manner. Due to the risk of fire it is important that best practice is applied. Follow the procedure below.

1. Drain the refrigerant.
2. Flush the circuit with inert gas.
3. Drain the circuit.
4. Flush again with inert gas.
5. Open the circuit by cutting or burning.

Collect the refrigerant in the intended container. Flush the system with oxygen-free nitrogen to make the device safe. This process may need to be repeated several times. Compressed air and oxygen may not be used.

Flush the system by breaking the vacuum with oxygen-free nitrogen, and filling the system to working pressure, relieving the pressure to atmospheric pressure and finally pumping to vacuum. Repeat the process until no refrigerant remains in the system. After the final filling of oxygen-free nitrogen, relieve the pressure in the system to atmospheric pressure, so that work can be carried out. This type of flushing must be carried out if hot work is to be performed on the pipe system.

Ensure that the vacuum pump's outlet is not near to ignition sources and that there is satisfactory ventilation by the outlet.

Filling

In addition to the conventional filling procedures, the following actions must be taken.

- Ensure that different refrigerants are not mixed when filling equipment is used. Hoses and lines must be as short as possible to minimise the enclosed refrigerant volume.
- Containers must be stored upright.
- Ensure that the cooling system is grounded before the system is filled with refrigerant.
- Mark the system once filling is complete (if not already marked).
- Take extra care not to overfill the cooling system.

Before refilling the system, pressure test it with oxygen-free nitrogen. Leak test the system after filling but before using the system. Perform an additional leak test before leaving the installation.

Leak testing

The following leak detection methods are deemed acceptable for systems containing flammable refrigerants.

Electronic leak detectors shall be used to detect flammable refrigerants, but the sensitivity may not be adequate, or may need re-calibration. (Detection equipment shall be calibrated in a refrigerant-free area.) Ensure that the detector is not a potential source of ignition and is suitable for the refrigerant used. Leak detection equipment shall be set at a percentage of the LFL of the refrigerant and shall be calibrated to the refrigerant employed and the appropriate percentage of gas (25 % maximum) is confirmed.

Leak detection fluids are suitable for use with most refrigerants but the use of detergents containing chlorine shall be avoided as the chlorine may react with the refrigerant and corrode the copper pipe-work.

If a leak is suspected, all naked flames shall be removed/extinguished.

If a leakage of refrigerant is found which requires brazing, all of the refrigerant shall be recovered from the system, or isolated (by means of shut off valves) in a part of the system remote from the leak. Oxygen free nitrogen (OFN) shall then be purged through the system both before and during the brazing process.

Decommissioning

Before performing this procedure, the technician must be familiar with the equipment and all its component parts. Good practice prescribes that all refrigerant is collected safely. Before the work is carried out, samples of oil and refrigerant must be taken, if analyses are required before collected refrigerant can be reused. There must be a power supply when this task is started.

1. Familiarise yourself with the equipment and its use.
2. Isolate the system electrically.
3. Before starting the procedure, ensure that:

   necessary equipment for mechanical handling of the refrigerant container is available

   all necessary personal safety equipment is available and used correctly

   the collection process is continuously supervised by an authorised person

   the collection equipment and containers meet appropriate standards.
4. Pump the refrigerant system to vacuum, if possible.
5. If it is not possible to pump to vacuum, manufacture a branch, so that the refrigerant can be retrieved from different parts of the system.
6. Check that the refrigerant container is on the scales before starting to collect.
7. Start the collection device and collect according to the manufacturer's instructions.
8. Do not overfill the containers (max 80 % (volume) liquid content).
9. Do not exceed the containers' maximum permitted working pressure – not even temporarily.
10. When the containers have been filled correctly and the process is complete, close all shut-off valves in the equipment and remove and containers and equipment from the installation immediately.
11. The collected refrigerant must not be filled in any other system before being cleaned and checked.

Marking

The equipment must be marked stating that it has been taken out of operation and drained of refrigerant. The marking must be dated and signed. Check that the equipment is marked indicating that it contains combustible refrigerant.

Collection

Best practice prescribes that all refrigerant is collected safely when the refrigerant is drained from a system, either for servicing or for decommissioning.

The refrigerant must only be collected in suitable refrigerant containers. Ensure that the required number of containers, that can hold the entire volume of the system, are available. All containers that are to be used must be intended for the collection of the refrigerant and marked for this refrigerant (especially designed for the collection of refrigerant). The containers must have the correctly functioning relief valves and shut-off valves. Empty collection containers must be drained and, if possible, chilled before collection.

The collection equipment must function correctly and instructions for the equipment must be to hand. The equipment must be suitable for the collection of combustible refrigerant.

Fully functioning and calibrated scales must also be to hand.

Hoses must be in good condition and be equipped with leak proof quick-couplings. Before using the collecting machine, check that it works correctly and has been well maintained, and that corresponding electrical components are sealed, to prevent ignition if any refrigerant should come out. Contact the manufacturer in the event of any doubts.

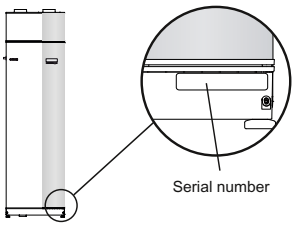
Return the collected refrigerant to the refrigerant supplier in the correct collection container and with

the relevant Waste Transfer Note. Do not mix refrigerants in collection devices or containers.

If compressors/compressor oil are/is to be removed ensure that the affected device is drained to an acceptable level to ensure that no combustible refrigerant remains in the lubricant. Compressors must be drained before being returned to the supplier. Only electrical heating of the compressor housing may be used to quicken draining. Drain oil from the system in a safe manner.

Serial number

The serial number can be found at the bottom right of the front cover and in the info menu (menu 3.1).



Caution

Always give the product's serial number (14 digits) when reporting a fault.

Country specific information

Installer manual

This installer manual must be left with the customer.

Great Britain

This installation is subject to building regulation approval, notify the local Authority of intention to install.

Use only manufacturer's recommended replacement parts.

benchmark
COLLECTIVE MARK
THE MARK OF QUALITY FOR THE INSTALLATION, COMMISSIONING AND SERVICING OF DOMESTIC HEATING AND HOT WATER SYSTEMS

Benchmark places responsibilities on both manufacturers and installers. the purpose is to ensure that customers are provided with the correct equipment for their needs, that it is installed, commissioned and serviced in accordance with the manufacturers instructions by competent persons and that it meets the requirements of the appropriate Building Regulations. The Benchmark Checklist can be used to demonstrate compliance with Building Regulations and should be provided to the customer for future reference.

Installers are required to carry out the installation, commissioning and servicing work in accordance with the Benchmark Code of practice which is available from the Heating and Hotwater Industry Council who manage and promote the Scheme. Visit www.centralheating.co.uk for information.

Warranty and insurance information

Thank you for installing a new NIBE heat pump in your home.

NIBE heat pumps are manufactured in Sweden to the very highest standard so we are pleased to offer our customers a comprehensive guarantee.

The product is guaranteed for 24 months for parts and labour from the date of installation or 33 months from the date of manufacture, whichever is the shorter.

The NIBE guarantee is based on the unit being installed and commissioned by a NIBE accredited installer, serviced every year and the Benchmark documents completed. Where this condition is not met, any chargeable spare parts or components issued within the applicable guarantee period still benefit from a 12 month warranty from the date of issue by the manufacturer.

We recommend the installer completes and returns as soon as possible, your guarantee registration card or completes the guarantee form on the NIBE website www.nibe.co.uk.

Electrical Supply

The heat pump must be permanently connected to a 230V ac 50Hz supply.

All system components shall be of an approved type and all wiring to current I.E.E wiring regulations.

External wiring must be correctly earthed, polarised and in accordance with the relevant standards: Currently this is BS 7671.

Domestic Hot Water

All domestic hot water circuits, connections and fittings must be in accordance with the relevant standards and water supply regulations. It should also be in accordance with the relevant requirements of the Local Authority and the Building Regulations relevant to the location of installation.

BS 6700 Services supplying water for domestic use within buildings and their cartilages.

Water Supply (Water Fitting) Regulations 1999 or The Water Bylaws 2000 (Scotland).

Heating System

The installation of the heat pump should follow best practice as covered in the following:

BS 5449 Forced circulation hot water central heating systems for domestic premises.

BS 15450 Heating systems in buildings – Design of heat pump heating systems.

Ventilation System

Any ventilation system should be designed and installed in accordance with Building Regulations, England & Wales Approved Document F1 and Scotland Technical Standard Section 3.14 Ventilation. Only this will ensure hygienic room air and prevent any dampness to the building structure.

To be able to ensure a high degree of efficiency and an extremely comfortable living environment, we recommend that the installation of any ventilation system should be planned and this plan be strictly followed by the ventilation engineer.

We recommend that the exhaust and supply air is extracted and supplied via metal spiral seam pipes with fitting seals approved to sealing class D, or suitable

equivalent UPVC plastic duct work and sealed with acrylic duct sealant. The exhaust air is extracted from the bathroom, toilet, kitchen and utility room. This will also apply to duct work carrying fresh air from the outside that is preheated in the heat pump and supplied the living quarters. Factors such as street noise, exhaust fumes, wind, general noise, cold and pollen can be taken into account choosing the right outside air vent. This ensures a controlled ventilation system with heat recovery and offers a high degree of comfort.

The discharge air duct work to outside must be insulated to ensure condensation does not form in the duct work.

Inspection of the installation

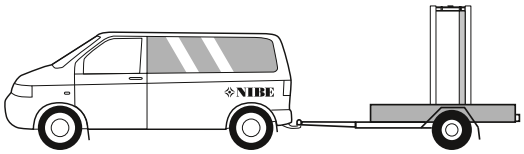
Current regulations require the heating installation to be inspected before it is commissioned. The inspection must be carried out by a suitably qualified person. Fill in the page for information about installation data in the User manual.

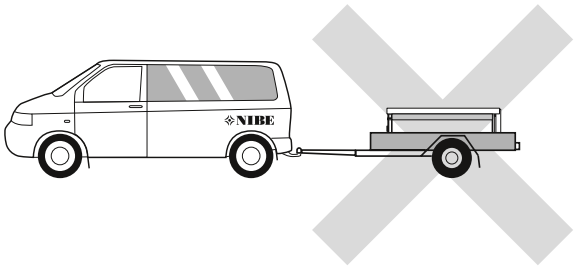
✔	Description	Notes	Signature	Date
Ventilation (page 17)				
	Setting ventilation flow exhaust air			
	Setting ventilation flow supply air			
	Connecting ground cables			
Heating medium (page 15)				
	System flushed			
	System vented			
	Circulation pump setting			
	Setting heating medium flow			
	Boiler pressure			
	Setting trim valve, number of turns from closed position			
	Expansion vessel			
	T&P valve			
	Tundish			
Electricity (page 18)				
	Fuses heat pump			
	Fuses property			
	Outside sensor			
	Room sensor			
	Safety breaker			
	Earth circuit-breaker			
Miscellaneous				
	Warranty			
	Benchmark checklist			

2 Delivery and handling

Transport

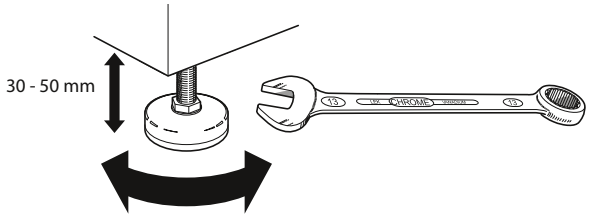
F470 should be transported and stored vertically in a dry place. The F470 may, however, be carefully laid on its back when being moved into a building. The centre of gravity is in the upper part.





Assembly

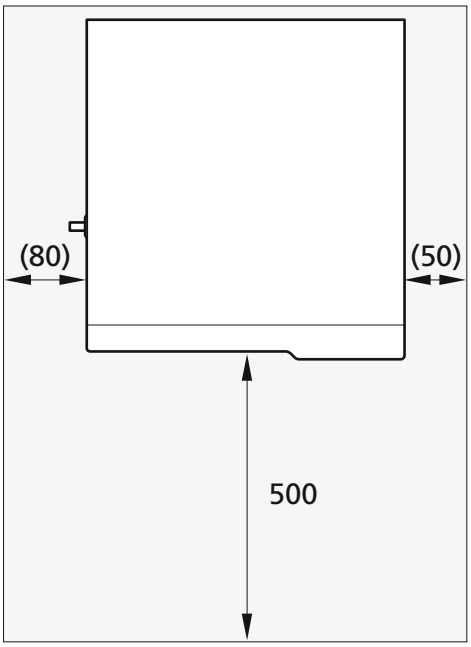
- Position F470 on a firm base that can take the weight, preferably on a concrete floor or foundation. Use the product's adjustable feet to obtain a horizontal and stable set-up.



- The area where F470 is located must be equipped with floor drainage.
- Install with its back to an outside wall, ideally in a room where noise does not matter, in order to eliminate noise problems. If this is not possible, avoid placing it against a wall behind a bedroom or other room where noise may be a problem.
- Wherever the unit is located, walls to sound sensitive rooms should be fitted with sound insulation.
- Route pipes so they are not fixed to an internal wall that backs on to a bedroom or living room.
- The heat pump's installation area should always have a temperature of at least 10 °C and max 30 °C.

Installation area

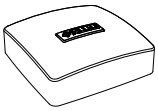
Leave a space of 500 mm in front of the product. Approx 50 mm free space is required in order to open the side hatches. The hatches do not need to be opened during service, all service on F470 can be carried out from the front. Leave space between the heat pump and wall behind (and any routing of supply cables and pipes) to reduce the risk reproduction of any vibration.



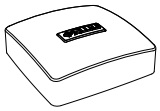
NOTE

Ensure that there is sufficient space (300 mm) above the heat pump for installing ventilation hoses.

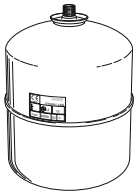
Supplied components



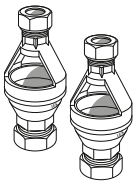
Outside sensor



Room sensor



Expansion vessel with holder
(supplied separately)



2 x tundish

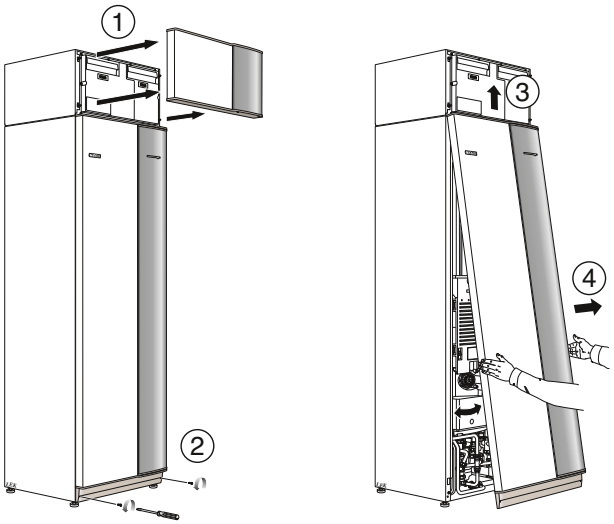
Earth cable

Location

The kit of supplied items is placed on top of the product.

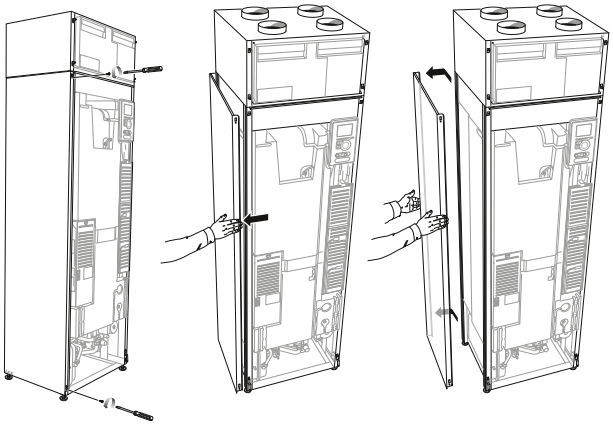
Removing the covers

Front cover



1. Remove the air treatment hatch by pulling it straight out.
2. Remove the screws from the lower edge of the front cover.
3. Lift the cover out at the bottom edge and up.
4. Pull the hatch towards yourself.

Side covers



The side covers can be removed to facilitate the installation.

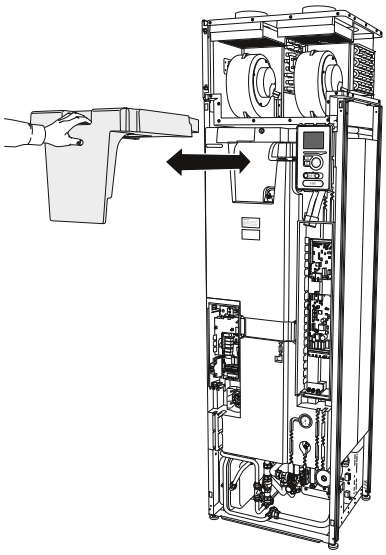
1. Remove the screws from the upper and lower edges.
2. Twist the cover slightly outward.
3. Move the cover backwards and slightly to the side.
4. Pull the cover to one side.
5. Pull the cover forwards.

Removing parts of the insulation

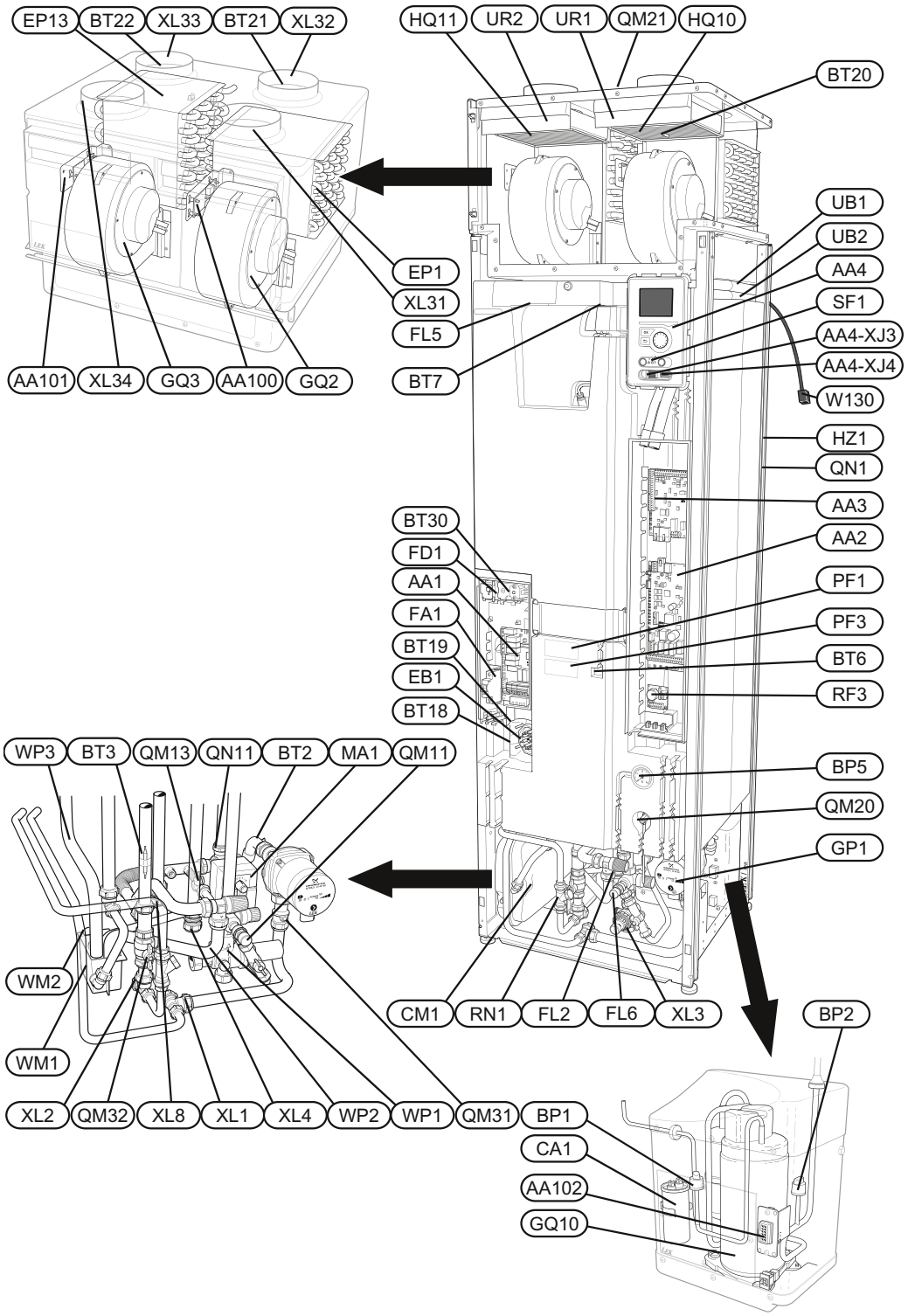
Parts of the insulation can be removed to facilitate the installation.

Insulation, top

1. Grip the handle and pull straight out as illustrated.



3 The heat pump design



Pipe connections

XL 1 Connection, heating medium flow line
XL 2 Connection, heating medium return line
XL 3 Connection, cold water
XL 4 Connection, hot water
XL 8 Connection, docking in
XL 10 Connection, draining heating medium
XL 31 Ventilation connection, exhaust air
XL 32 Ventilation connection, extract air
XL 33 Ventilation connection, supply air
XL 34 Ventilation connection, outdoor air

HVAC components

CM 1 Expansion vessel
EP 13 Supply air battery
FL 1 Expansion relief valve, safety valve, hot water heater
FL 2 Safety valve, climate system
FL 5 T&P valve
FL 6 Vacuum valve
GP 1 Circulation pump
QM 10 Filler valve, hot water heater
QM 11 Filler valve, climate system
QM 13 Filler valve 2, climate system
QM 20 Venting, climate system
QM 21 Venting, supply air coil[1]
QM 31 Shut-off valve, heating medium flow
QM 32 Shut off valve, heating medium return
QN 11 Shunt valve
QN 17 Pressure reduction valve
RN 1 Trim valve
WM 1 Tundish
WM 2 Overflow water discharge
WP 1 Overflow pipe, safety valve hot water heater
WP 2 Overflow pipe, safety valve climate system
WP 3 Condensation lead off, fan box

Sensors etc.

BP 1 High pressure pressostat
BP 2 Low pressure pressostat
BP 5 Pressure gauge, heating system
BT 1 Outdoor sensor[1]
BT 2 Temperature sensors, heating medium flow
BT 3 Temperature sensors, heating medium return
BT 6 Temperature sensor, hot water, control
BT 7 Temperature sensor, hot water, display
BT 16 Temperature sensor, evaporator[1]
BT 18 Temperature sensor, compressor operation
BT 19 Temperature sensor, immersion heater operation
BT 20 Temperature sensor, exhaust air
BT 21 Temperature sensor, extract air
BT 22 Temperature sensor, supply air
BT 30 Thermostat, backup heating
BT 50 Room sensor[1]

Electrical components

AA 1 Immersion heater card
AA 2 Base card
AA 3 Input circuit board
AA 4 Display unit
AA4-XJ3 USB socket
AA4-XJ4 Service socket
AA100 Connection card air treatment section, exhaust air
AA101 Connection card air treatment section, supply air
AA102 Connection card compressor card
CA 1 Capacitor
EB 1 Immersion heater
FA 1 Miniature circuit-breaker
FD 1 Temperature limiter
MA 1 Shunt motor with hand wheel
RF 3 EMC-filter
SF 1 Switch
W130 Network cable for NIBE Uplink™

Cooling components

EP 1 Evaporator
GQ 10 Compressor
HZ 1 Drying filter with tank[1]
QN 1 Expansion valve[1]

Ventilation

GQ 2 Exhaust air fan
GQ 3 Supply air fan
HQ 10 Exhaust air filter[1]
HQ 11 Supply air filter[1]
UR 1 Filter cover, exhaust air
UR 2 Filter cover, supply air

Miscellaneous

PF 1 Rating plate
PF 3 Serial number plate
UB1 Cable gland
UB2 Cable gland

[1]Not visible in the image

Designations in component locations according to standard IEC 81346-1 and 81346-2.

4 Pipe and ventilation connections

General pipe connections

Pipe installation must be carried out in accordance with current norms and directives.

The system requires a low-temperature design of the radiator circuit. At lowest dimensioned outdoor temperature (DUT) the highest recommended temperatures are 55 °C on the flow line and 45 °C on the return line.

NOTE

The pipe system needs to be flushed out before the heat pump is connected so that any debris cannot damage component parts.

NOTE

This installation is subject to building regulation approval, notify the local Authority of intention to install.

NOTE

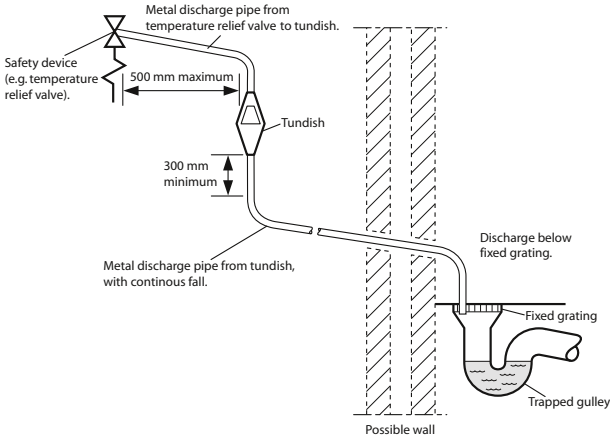
Use only manufacturer's recommended replacement parts.

Waste water from the collection tray at the evaporator and from the safety valve is led by a non-pressurised overflow pipe to the drain so that hot water cannot cause damage. Likewise should the discharge pipes (tundishes), drain valves and motorised valves be positioned clearly away from any electrical components. This is the only thing the non-pressurised overflow pipe may be used for. Even overflow pipes from tundish connected to the expansion relief valve must be connected to the drain in the same way.

Please note that the connection of the T&P-valve should not be used for any other purpose.

Valves may not be positioned between the expansion valve and the vessel.

Discharge pipes from tundishes shall have av vertical section of pipe at least 300 mm long, before any elbows or bends in the pipework (see following picture).


Metal discharge pipe from temperature relief valve to tundish.
Safety device (e.g. temperature relief valve).
500 mm maximum
Tundish
300 mm minimum
Metal discharge pipe from tundish, with continous fall.
Discharge below fixed grating.
Fixed grating
Trapped gulley
Possible wall

Valve outlet size	Minimum size of discharge pipe	Minimum size of discharge pipe from tundish	Maximum resistance allowed, expressed as a lenght of straight pipe (i.e. no elbows or bends)	Resistance created by each elbow or bend
G1/2	15 mm	22 mm	up to 9 m	0.8 mm
G1/2	15 mm	28 mm	up to 18 m	1.0 mm
G1/2	15 mm	35 mm	up to 27 m	1.4 mm
<G3>/4	22 mm	28 mm	up to 9 m	1.0 mm
<G3>/4	22 mm	35 mm	up to 18 m	1.4 mm
<G3>/4	22 mm	42 mm	up to 27 m	1.7 mm
G1	28 mm	35 mm	up to 9 m	1.4 mm
G1	28 mm	42 mm	up to 18 m	1.7 mm
G1	28 mm	54 mm	up to 27 m	2.3 mm

Hard water areas

Usually, there should not be a problem in installing F470 in areas of hard water as the operating temperature is 50-60 °C.

Cleaning the climate system

When the water heater and the climate system have been filled with water, F470 must operate at maximum normal temperature for at least one hour. Thereafter the system must be drained of water and refilled. See section Service actions on page 52.

Before installing the heat pump in an existing system, it is important that the system is properly flushed through.

Even if the heat pump is to be installed in a new system, the heat pump and system should be flushed.

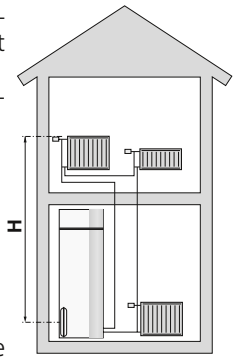
NOTE

Ensure that cleaning agent has been removed from the entire system before adding inhibitor.

After flushing an inhibitor should be used for long-term anti-corrosion protection.

NIBE Energy Systems Limited recommends water treatments (supplied by e.g. Fernox and Sentinel) specifically designed for heat pumps.

Maximum boiler and radiator volumes



The volume of the pressure expansion vessel (CM1) is 10 litres and it is pressurised as standard to 0.5 bar ((5 mvp). As a result, the maximum permitted height "H" between the vessel and the highest radiator is 5 metres; see figure.

If the standard initial pressure in the pressure vessel is not high enough it can be increased by adding air via the valve in the expansion vessel. The initial pressure of the expansion vessel must be stated in the inspection document. Any change in the initial pressure affects the ability of the expansion vessel to handle the expansion of the water.

The maximum system volume excluding the boiler is 219 litres at the above pre-pressure.

System diagram

F470 consists of a heat pump, water heater, immersion heater, fans, circulation pump and control system.F470 is connected to the ventilation system and heating medium circuit.

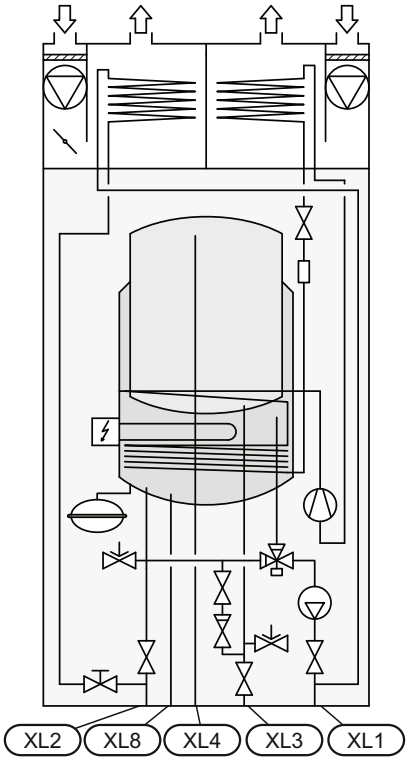
When the exhaust air at room temperature passes through the evaporator, the refrigerant evaporates because of its low boiling point. In this way the energy in the room air is transferred to the refrigerant.

The refrigerant is then compressed in a compressor, causing the temperature to rise considerably.

The warm refrigerant is led to the condenser. Here the refrigerant gives off its energy to the boiler water, whereupon the refrigerant changes state from gas to liquid.

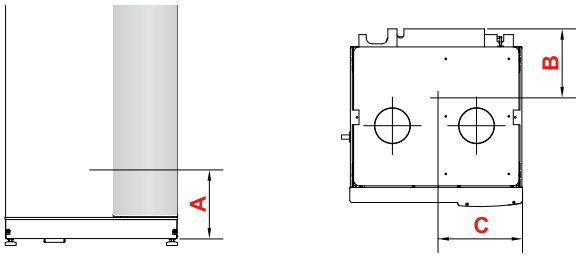
The refrigerant then goes via filters to the expansion valve, where the pressure and temperature are reduced.

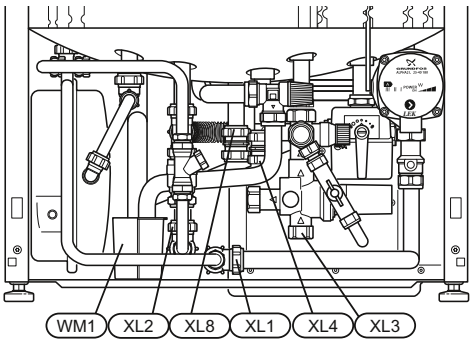
The refrigerant has now completed its circulation and returns to the evaporator.



XL 1	Connection, heating medium flow
XL 2	Connection, heating medium return
XL 3	Connection, cold water
XL 4	Connection, hot water
XL 8	Connection, docking

Dimensions and pipe connections





Setting out dimensions

Connection		A	B	C
XL1 Heating medium supply	(mm)	30	465	320
XL2 Heating medium return	(mm)	45	420	365
XL3 Cold water	(mm)	80	455	210
XL4 Hot water	(mm)	170	400	260
XL8 Docking	(mm)	175	290	295
WM1 Drip tray	(mm)	60	200	420

Pipe dimensions

Connection		
Heating medium ext Ø	(mm)	22
Cold water ext Ø	(mm)	22
Hot water ext Ø	(mm)	22
Docking ext Ø	(mm)	22
Overflow water discharge	(mm)	32

Connection		
CM1 Expansion tank (connection) Ø	G20	int.
XL1 Heating medium, flow line Ø	G25	int.
XL2 Heating medium, return line Ø	G25	int.
XL3 Cold water Ø	G25	int.
XL4 Hot water Ø	G25	int.
XL8 Docking connection, flow line Ø	G25	int.
XL9 Docking connection, return line Ø	G25	int.

Symbol key

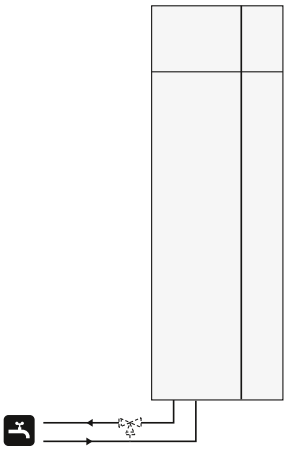
Symbol	Meaning
	Venting valve
	Shut-off valve
	Non-return valve
	Shunt / shuttle valve
	Safety valve
	Trim valve
	Tundish
	Temperature sensor
	Expansion vessel
Ⓟ	Pressure gauge
	Circulation pump
	Particle filter
	Compressor
	Heat exchanger

Cold and hot water

Connecting cold and hot water

A mixing valve must also be installed if the factory setting for hot water is changed. National regulations must be observed. The setting is made in menu 5.1.1 (page 48).

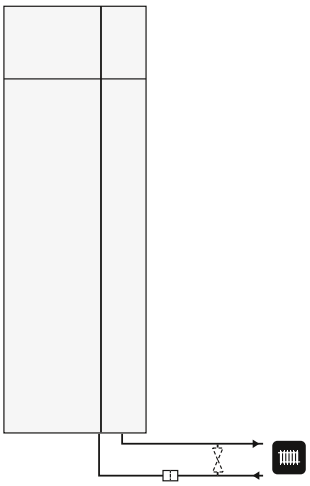
The flexible hose to the expansion vessel can be installed in the plugged connection on the safety valve.



Heating medium side

Connecting the climate system

When connecting to a system with thermostats on all radiators/underfloor heating coils, a relief valve must be fitted, or a thermostat must be removed to ensure sufficient flow.



Supply air battery

The supply air coil is connected in parallel with the radiator circuit and heats the house's supply air. The water flow through the supply air battery is set by means of a trim valve (RN1). The supply air temperature must be approximately the same as the indoor temperature, preferably a few degrees lower.

TIP

If possible, choose a cold day to adjust the trim valve.

Installation alternative

F470 can be connected in several different ways, some of which are shown below.

Further option information is available at www.nibe.co.uk and in the respective assembly instruction for the accessory used. See page 58 move the list of the accessories that can be used to F470.

Extra hot water heaters

Extra hot water heaters

The heat pump should be supplemented with an electric water heater, if a hot tub or other significant consumer of hot water is installed.

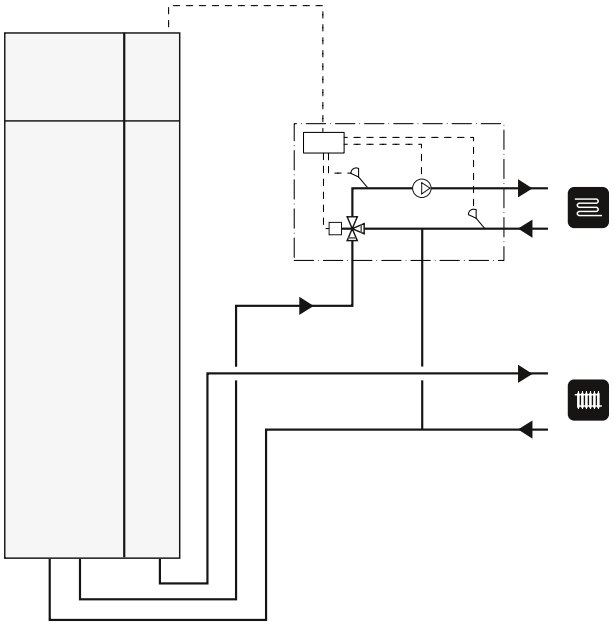
Water heater with immersion heater

If it is possible to use a water heater with an immersion heater, NIBE COMPACT or EMINENT type water heaters can be used.

Two or more climate systems

When more than one climate system is to be heated, the following connection can be used.

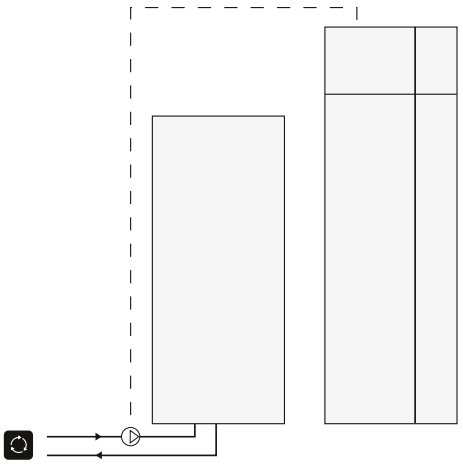
The ECS 40/ECS 41. accessory is required for this connection.



Connecting hot water circulation

To reduce the risk of bacterial growth in systems with hot water circulation, the temperature of the circulating water should not fall below 50 °C. There should not be any non-circulatory hot water pipes. Adjust the hot water system so that the temperature does not fall below 50 °C at the ends of the system.

The circulation pump for hot water circulation can be controlled by the heat pump. The HWC return can be connected to a freestanding water heater.



General ventilation connection

Ventilation installation must be carried out in accordance with current norms and directives.

To prevent fan noise being transferred to the ventilation devices, it may be a good idea to install a silencer in the duct. This is especially important if there are ventilation devices in bedrooms.

Connections must be made via flexible hoses, which must be installed so that they are easy to replace. The extract air and outdoor air ducts are to be insulated using diffusion-proof material along their entire lengths. Ensure that the condensation insulation is sealed at any joints and/or at lead in nipples, silencers, roof cowls or similar. Provision must be made for inspection and cleaning of the duct. Make sure that there are no reductions of cross-sectional area in the form of creases, tight bends etc, since this will reduce the ventilation capacity. The air duct system must be a minimum of air tightness class B. The extract air duct must be a maximum of 20 m long with a maximum of six bends.

Because the heat pump contains the flammable refrigerant propane (R290), the air ducting system must be grounded. This is done by making a good electrical connection to the four ventilation ducts using the 4 ground cables supplied. The cables must then be connected to the ground studs on top of the top cover.

Exhaust air duct/kitchen fan

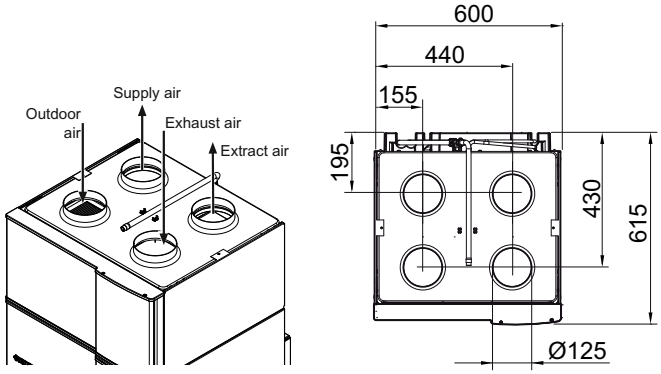
Exhaust air duct (kitchen fan) must not be connected to F470.

To prevent cooking odours being led to the F470 the distance between the kitchen fan and the exhaust air valve must be observed. The distance must not be below 1.5 m, but may vary between different installations.

Always use a kitchen fan when cooking.

NOTE

A duct in a masonry chimney stack must not be used for extract air.



Ventilation flow

Connect F470 so that all exhaust air except exhaust air duct air (kitchen fan) passes the evaporator (EP1) in the heat pump. Lowest ventilation flow must fulfill applicable national norms. For optimum heat pump performance the ventilation flow should not be less than 28 l/s (100 m3/h) at an exhaust air temperature of at least 20 °C. On occasions when the exhaust air temperatures are lower than 20 °C (for example on start up and when there is no one in the accommodation) the minimum value is 31 l/s (110 m3/h). The supply air flow must be lower than the exhaust air flow to prevent over pressure in the house.

The heat pump's installation area should be ventilated with at least 5 l/s (18 m^3/h). The installation area must have a volume of at least 8 m^3.

Ensure that the ventilation openings are not blocked. Set the ventilation capacity in the heat pump's menu system (menu 5.1.5).

Adjusting ventilation

To obtain the necessary air exchange in every room of the house, the exhaust air device and the supply air device must be correctly positioned and adjusted and the fans in the heat pump adjusted.

The factory setting for the ventilation on the heat pump is low and you should therefore adjust the ventilation immediately after installation so that it is set according to the projected value for the house.

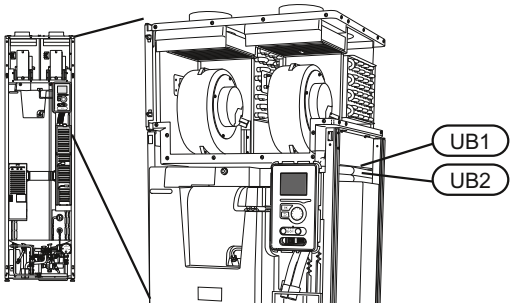
A defective ventilation installation may lead to reduced installation efficiency and thus poorer operating economy, and may result in moisture damage to the house.

5 Electrical connections

General

All electrical equipment, except the outdoor temperature sensors and room temperature sensors are ready connected at the factory.

- Disconnect the heat pump before insulation testing the house wiring.
- If the building is equipped with an earth-fault breaker, F470 should be equipped with a separate one.
- If a miniature circuit breaker is used it should have at least motor characteristic "C". See page 60 for fuse size.
- For the heat pump wiring diagram, see page 62.
- Communication and sensor cables to external connections must not be laid close to high current cables.
- The minimum area of communication and sensor cables to external connections must be 0.5 mm^2 up to 50 m, for example EKKX or LiYY or equivalent.
- When cable routing in F470, cable grommets UB1and UB2, (marked in image) must be used. In UB1 and UB2 the cables are inserted through the heat pump from the back to the front. For dimensions diagram see page 20.

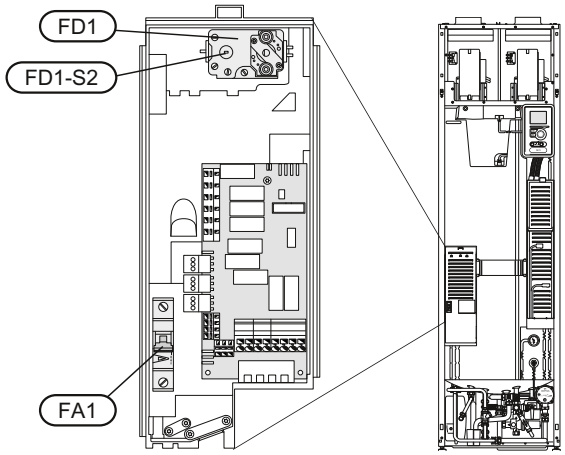


NOTE

The switch (SF1) must not be moved to "I" or "⚠" until the boiler has been filled with water. Otherwise the temperature limiter, thermostat and the immersion heater can be damaged.

NOTE

Electrical installation and service must be carried out under the supervision of a qualified electrician. Cut the current with the circuit breaker before carrying out any servicing. Electrical installation and wiring must be carried out in accordance with the stipulations in force.



Miniature circuit-breaker

Operation (230 V), fans, compressor, circulation pump etc. are internally fused by a miniature circuit-breaker (FA1).

Temperature limiter

The temperature limiter (FD1) cuts the current supply to the electrical addition if the temperature rises between 90 and 100°C and can be manually reset.

Resetting

The temperature limiter (FD1) is accessible behind the front cover. Reset the temperature limiter by pressing the button (FD1-SF2) using a small screwdriver.

Caution

Check the temperature limiter and miniature circuit-breaker. They may have tripped during transportation.

Temperature limiter, compressor

The temperature limiter (FD2) cuts the current supply to the soft starter if the temperature rises above 88 °C and is manually reset.

Resetting

The temperature limiter (FD2) is accessible behind the front cover. Reset the temperature limiter by pressing the button (FD2-SF2) using a small screwdriver.

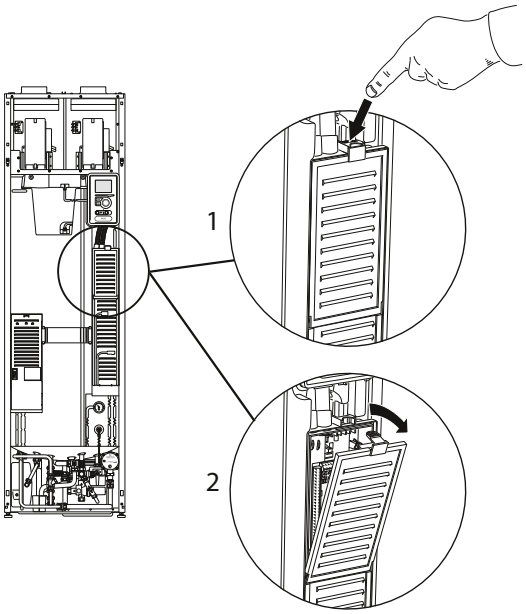
Accessibility, electrical connection

The plastic cap of the electrical boxes is opened using a screwdriver.

NOTE

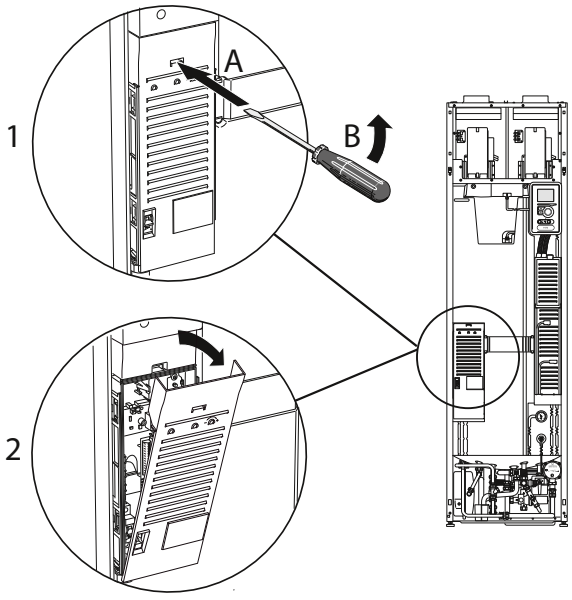
The cover for the input card is opened without a tool.

Removing the cover, input circuit board



1. Push the catch down.
2. Angle out the cover and remove it.

Removing the cover, immersion heater circuit board

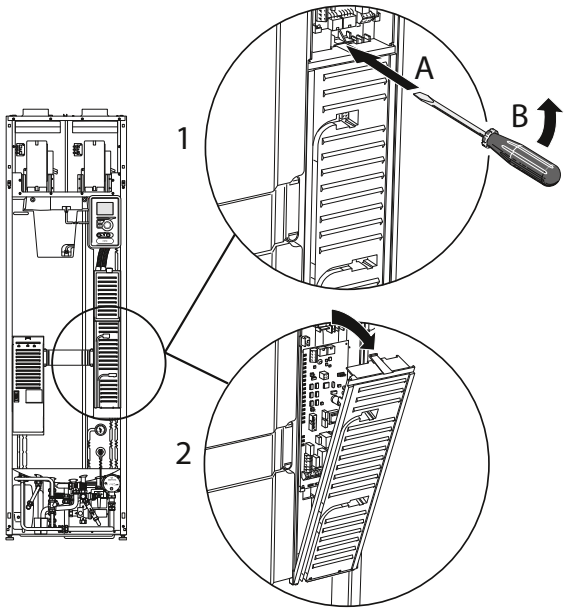


1. Insert the screwdriver (A) and pry the catch carefully downwards (B).
2. Angle out the cover and remove it.

Removing the cover, base board

Caution

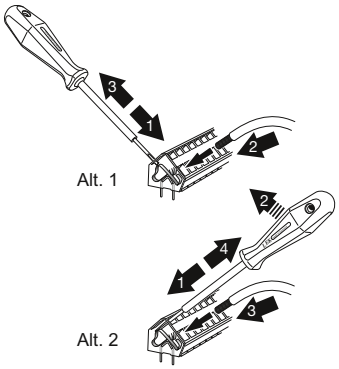
To remove the cover for the base board, the cover for the input circuit board must first be removed.



1. Insert the screwdriver (A) and pry the catch carefully downwards (B).
2. Angle out the cover and remove it.

Cable lock

Use a suitable tool to release/lock cables in the heat pump terminal blocks.



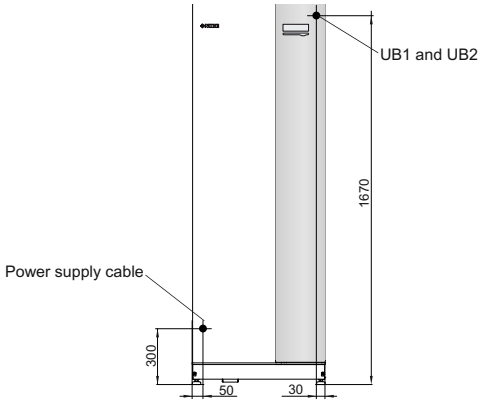
Connections

NOTE

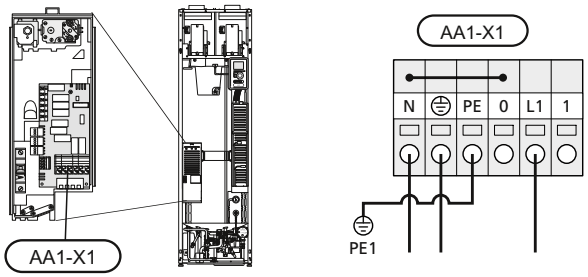
To prevent interference, unscreened communication and/or sensor to external connections cables must not be laid closer than 20 cm to high voltage cable when cable routing.

Power connection

F470 must be installed via an isolator switch with a minimum breaking gap of 3mm. Minimum cable area must be dimensioned according to the fuse rating used. Supplied cable (length approx 2 m) for incoming electricity is connected to terminal block X1 on the immersion heater card (AA1). The connection cable can be found on the reverse of F470 (see dimensions diagram below).



Connection 1x230V



Tariff control

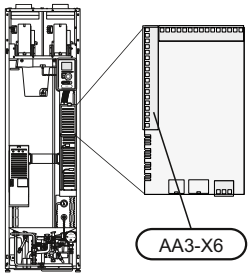
If the voltage to the immersion heater and/or the compressor disappears during a certain period, there must also be blocking via the AUX-input, see "Connection options- Possible selection for AUX inputs".

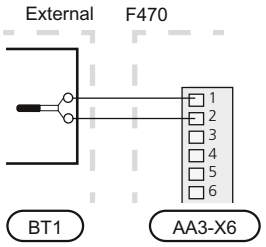
Outside sensor

Install the outside temperature sensor (BT1) in the shade on a wall facing north or north-west, so it is unaffected by the morning sun.

Connect the sensor to terminal block X6:1 and X6:2 on the input card (AA3). Use a twin core cable of at least 0.5 mm^2 cable area.

If a conduit is used it must be sealed to prevent condensation in the sensor capsule.





Room sensor

F470 is delivered with a room sensor supplied (BT50). The room temperature sensor has up to three functions:

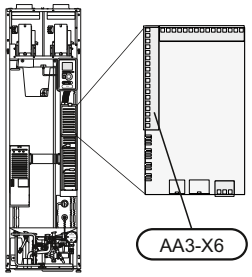
1. Show current room temperature in F470's display.
2. Option of changing the room temperature in °C.
3. Makes it possible to change/stabilise the room temperature.

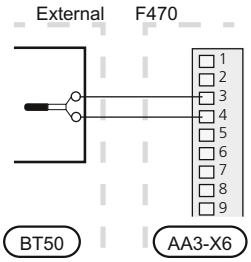
Install the sensor in a neutral position where the set temperature is required. A suitable location is on a free inner wall in a hall approx. 1.5 m above the floor. It is important that the sensor is not obstructed from measuring the correct room temperature by being located, for example, in a recess, between shelves, behind a curtain, above or close to a heat source, in a draft from an external door or in direct sunlight. Closed radiator thermostats can also cause problems.

The heat pump operates without the sensor, but if one wishes to read off the accommodation's indoor temperature in F470's display the sensor must be installed. Connect the room sensor to X6:3 and X6:4 on the input circuit board (AA3).

If the sensor is to be used to change the room temperature in °C and/or to change/stabilise the room temperature, the sensor must be activated in menu 1.9.4.

If the room sensor is used in a room with under floor heating it should only have an indicatory function, not control of the room temperature.

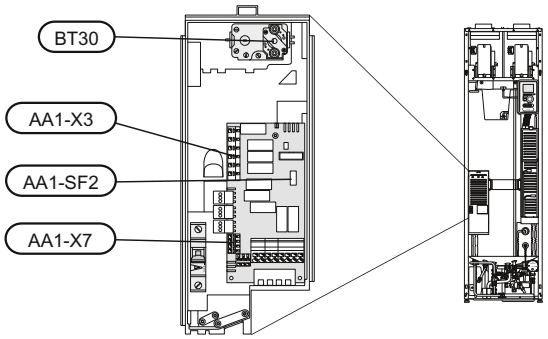




Caution

Changes of temperature in accommodation take time. For example, short time periods in combination with underfloor heating will not give a noticeable difference in room temperature.

Settings



Electrical addition - maximum output

The immersion heater can be set up to a maximum of 8 kW. The delivery setting is 5.3 kW.

The immersion heater output is divided into steps, according to the table.

Setting maximum output in the electrical addition is done in menu 5.1.12.

Power steps of the immersion heater

Electrical addition (kW)	Fusing (A)	Max (A)
0	10	6.3
2.67	20	17.9
5.30	32	29.3
8	40	41

The table displays the maximum phase current for the relevant electrical step for the heat pump.

Emergency mode

When the heat pump is set to emergency mode (SF1 is set to ⚠) only the most necessary functions are activated.

- The compressor and fans are off and heating is managed by the immersion heater.

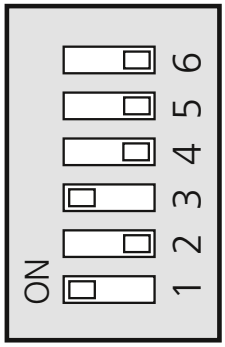
NOTE

Switch (SF1) must not be moved to "I" or "⚠" until F470 has been filled with water. Otherwise the temperature limiter, thermostat and the immersion heater can be damaged.

Power in emergency mode

The immersion heater's output in emergency mode is set with the dipswitch (S2) on the immersion heater circuit board (AA1) according to the table below. Factory setting is 5.3 kW.

kW	1	2	3	4	5	6
2.67	**on**	off	off	off	off	off
5.30	**on**	off	**on**	off	off	off
8	**on**	off	**on**	off	**on**	off

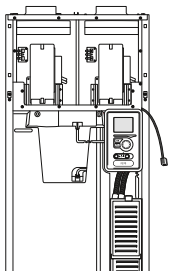


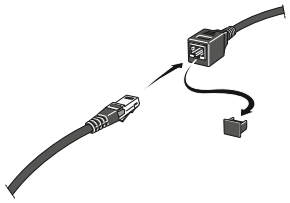
The image shows the dip-switch (AA1-S2) in the factory setting, that is 5.3 kW.

Optional connections

NIBE Uplink™

Connect the network connected cable (straight, Cat.5e UTP) with RJ45-contact (male) to RJ45 contact (female) on the rear of the heat pump.





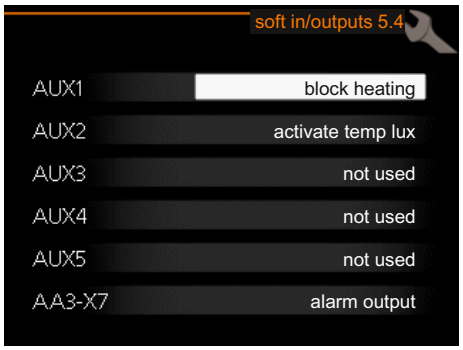
External connection options

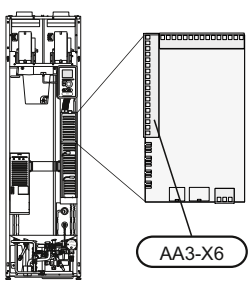
F470 has software controlled inputs and outputs on the input card (AA3), for connecting the extern switch function or sensor. This means that when an external switch function or sensor is connected to one of six special connections, the correct function must be selected to the correct connection in the software in F470.

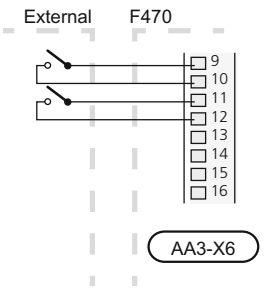
Caution

If an external switch function or sensor is connected to F470, the function to use input or output must be selected in menu 5.4, see page 50.

Selectable inputs on the input card for these functions are AUX1 (X6:9-10), AUX2 (X6:11-12), AUX3 (X6:13-14), AUX4 (X6:15-16) and AUX5 (X6:17-18). Selectable outputs are AA3:X7.







The example above uses the inputs AUX1 (X6:9-10) andAUX2 (X6:11-12) on the input circuit board (AA3).

Caution

Some of the following functions can also be activated and scheduled via menu settings.

Possible selection for AUX inputs

Switch for external blocking of addition and/or compressor

In those cases external blocking of addition and/or compressor is wanted, this can be connected to terminal block X6 on the input card (AA3), which is positioned behind the front cover.

The additional heat and/or the compressor are disconnected by connecting a potential free switch function to the input selected in menu 5.4, see page 50.

External blocking of addition and compressor can be combined.

A closed contact results in the electrical output being disconnected.

Contact for external tariff blocking

In those cases external tariff blocking is used, this can be connected to terminal block X6 on the input card (AA3), which is positioned behind the front cover.

Tariff blocking means that the additional heat, the compressor and heating are disconnected by connecting a potential free switch function to the input selected in menu 5.4, see page 50.

A closed contact results in the electrical output being disconnected.

Switch for external blocking of heating

In those cases external blocking of heat is used, this can be connected to terminal block X6 on the input card (AA3), which is positioned behind the front cover.

Heating operation is disconnected by connecting a potential free switch function to the input selected in menu 5.4, see page 50.

A closed switch results in blocked heating operation.

Contact for activation of "temporary lux"

An external contact function can be connected to F470 for activation of the hot water function"temporary lux". The switch must be potential free and connected to the selected input (menu 5.4, see page 50) on terminal block X6 on the input circuit board (AA3).

"temporary lux" is activated for the time that the contact is connected.

Contact for activation of "external adjustment"

An external contact function can be connected to F470 to change the supply temperature and the room temperature.

When the switch is closed the temperature changes in °C (if the room sensor is connected and activated). If a room sensor is not connected or not activated, the desired offset of "temperature" (heating curve offset) is

set with the number of steps selected. The value is adjustable between -10 and +10.

- *climate system 1*

  The switch must be potential free and connected to the selected input (menu 5.4, see page 50) on terminal block X6 on the input circuit board (AA3).

  The value for the change is set in menu 1.9.2, "external adjustment".

- *climate system 2 to 4*

  External adjustment for climate systems 2 to 4 require accessories (ECS 40).

  See the accessory's installer handbook for installation instructions.

Contact for activation of fan speed

An external contact function can be connected to F470 for activation of one of the four fan speeds. The switch must be potential free and connected to the selected input (menu 5.4, see page 50) on terminal block X6 on the input circuit board (AA3). When the switch closes, the selected fan speed is activated. Normal speed is resumed when the contact is opened again.

Possible selection for AUX output (potential free variable relay)

It is possible to have an external connection through the relay function via a potential free variable relay (max 2 A) on the input circuit board (AA3), terminal block X7.

Optional functions for external connection:

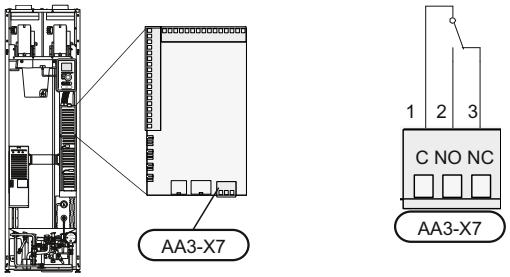
- Indication of buzzer alarm.
- Control of circulation pump for hot water circulation.
- External circulation pump, for example external pump and shunt group.

If any of the above is installed to terminal block X7 it must be selected in menu 5.4, see page 50.

The common alarm is preselected at the factory.

NOTE

An accessory card is required if several functions are connected to terminal block X7 at the same time that the buzzer alarm is activated (see page 58).



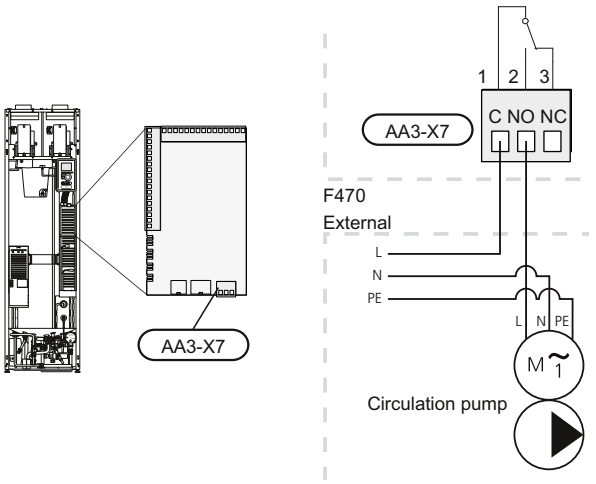
The picture shows the relay in the alarm position.

When switch (SF1) is in the "⏻" or "⚠" position the relay is in the alarm position.

External circulation pump or hot water circulation pump connected to the buzzer alarm relay as illustrated below.

NOTE

Mark up any junction boxes with warnings for external voltage.



Connecting accessories

Instructions for connecting accessories are provided in the manual accompanying the accessory. See page 58 for the list of the accessories that can be used with F470.

6 Commissioning and adjusting

Preparations

1. Check that the switch (SF1) is in position " ⏻".
2. Check that the filling valve (QM11) is fully closed and that the temperature limiter (FD1) has not deployed.

Caution

Check the temperature limiter (FD1) and miniature circuit-breaker (FA1) in the heat pump. They may have tripped during transportation.

Filling and venting

Filling the hot water heater

1. Open a hot water tap in the house.
2. Open the externally mounted filler valve. This valve should then be fully open during operations.
3. When water comes out of the hot water tap, the hot water heater is full and the tap can be closed.

Filling the climate system

1. Check that the shut off valves for the heating system (QM31) and (QM32) are open.
2. Open the vent valves (QM20) and (QM21).
3. Check if the flexi hose supplied is connected between connection (QM11) and connection (QM13). Adjust the hose if this has not been done.
4. Open the filler valves (QM11), (QM13). The boiler unit and the rest of the climate system are filled with water.
5. When the water that exits the bleed valves (QM20) and (QM21) is not mixed with air, close the valves. After a while the pressure rises on the pressure gauge (BP5). When the pressure reaches 2.5 bar (0.25 MPa) the safety valve (FL2) starts to release water. Close the filler valves (QM11) and (QM13).
6. Reduce the boiler pressure to the normal working range (approx. 1 bar) by opening the vent valves (QM20) and (QM21) or safety valve (FL2).
7. Check that there is water in the overflow cup (WM1).

If the overflow cup requires topping up:

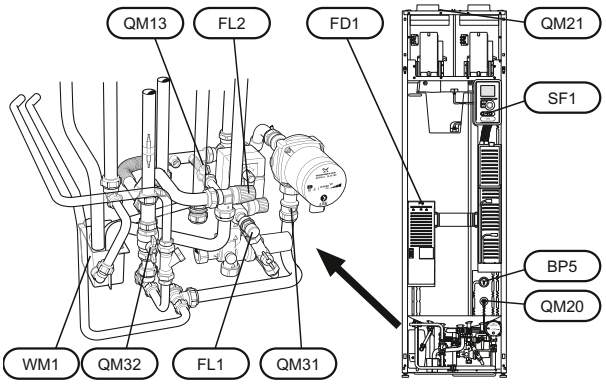
1. Turn the safety valve (FL1) anticlockwise carefully.

Venting the climate system

1. Turn off the power supply to the heat pump.
2. Vent the heat pump via the vent valve (QM20) and the rest of the climate system via the relevant vent valves.
3. Vent the supply air battery via its vent valve (QM21).
4. Keep topping up and venting until all air has been removed and the pressure is correct.

NOTE

The vent pipe from the container must be drained of water before air can be released. This means that the system is not necessarily bled despite the flow of water when the bleed valve (QM20) is opened.



Start-up and inspection

Start guide

NOTE

There must be water in the climate system before the switch is set to "I".

1. Turn the heat pump's switch (SF1) to "I".
2. Follow the instructions in the start guide in the heat pump display. If the start guide does not start when you start the heat pump, start it manually in menu 5.7.

TIP

See page 30 for a more in-depth introduction to the heat pump's control system (operation, menus etc.).

Commissioning

The first time the heat pump is started a start guide is started. The start guide instructions state what needs to carried out at the first start together with a run through of the heat pump's basic settings.

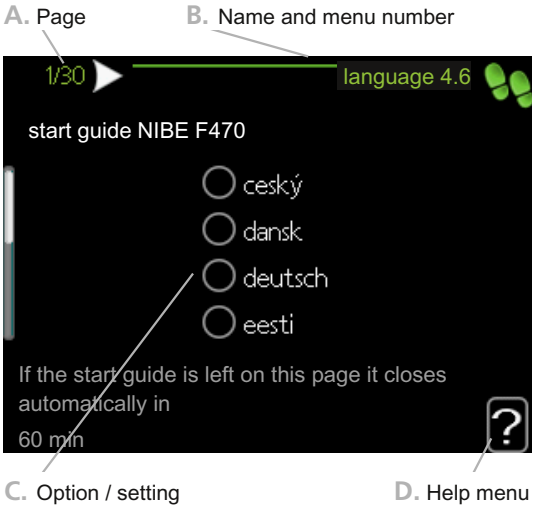
The start guide ensures that the start-up is carried out correctly and cannot be bypassed. The start guide can be started later in menu 5.7.

Caution

As long as the start guide is active, no function in the installation will start automatically.

The guide will appear at each installation re-start until it is deselected on the last page.

Operation in the start guide



A. Page

Here you can see how far you have come in the start guide.

Scroll between the pages of the start guide as follows:

1. Turn the control knob until one of the arrows in the top left corner (at the page number) has been marked.
2. Press the OK button to skip between the pages in the start guide.

B. Name and menu number

Read what menu in the control system this page of the start guide is based on. The digits in brackets refer to the menu number in the control system.

If you want to read more about affected menus either read off in the sub-menu or in the installation manual from page 34.

C. Option / setting

Make settings for the system here.

D. Help menu

In many menus there is a symbol that indicates that extra help is available.

To access the help text:

1. Use the control knob to select the help symbol.
2. Press the OK button.

The help text often consists of several windows that you can scroll between using the control knob.

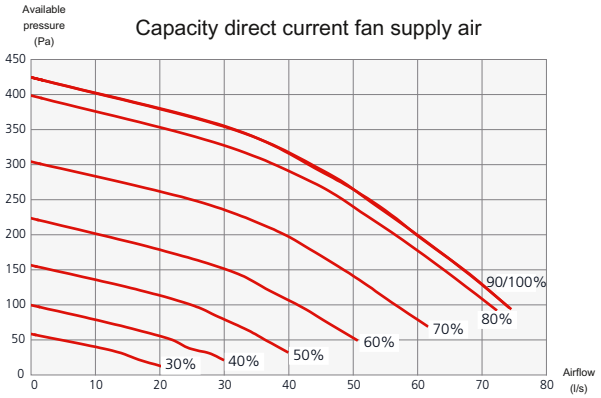
Setting the ventilation

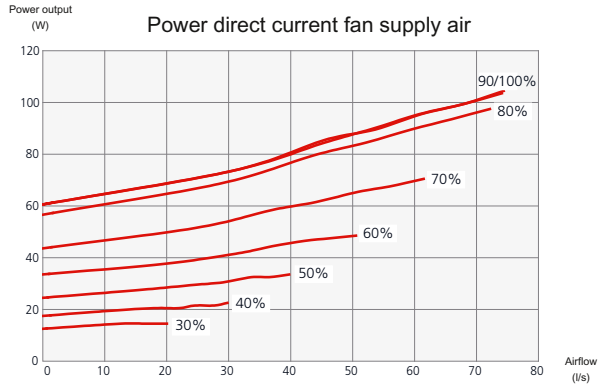
The factory setting for ventilation on the heat pump is high. Ventilation must be set according to applicable norms. The supply air flow is adjusted so that it is 80% of the exhaust air flow. The setting is made in menu 5.1.5.

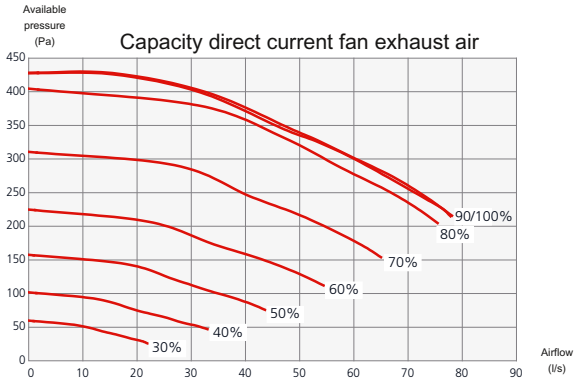
Even if ventilation is roughly set at installation it is important that a ventilation adjustment is ordered and permitted.

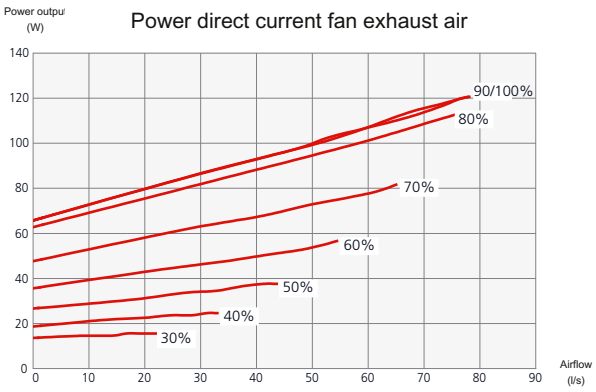
NOTE

Order a ventilation adjustment to complete the setting.







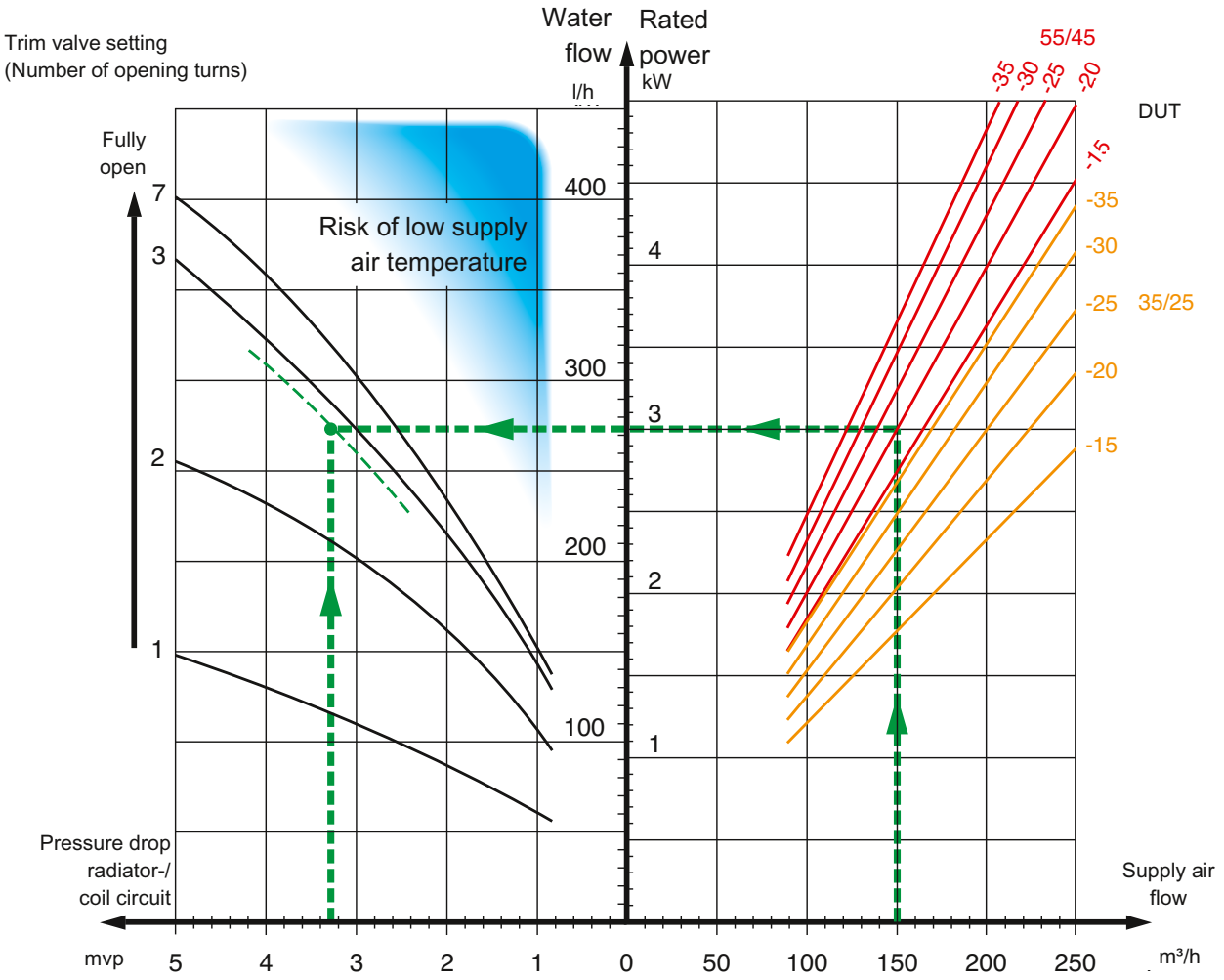


Supply air battery

The water flow through the supply air coil is set by means of a trim valve (RN1). This valve must be adjusted to prevent unnecessary energy consumption in the accommodation. The additional output is determined according to the diagram below. The supply air temperature must be approximately the same as the indoor temperature, preferably a few degrees lower.

TIP

Post-adjust the trim valve on a cold day.



The delivered output in the diagram is calculated when dimensioning the heating system 55/45°C respective 35/25°C (underfloor heating).

Example: If the supply air flow rate is set to 150 m^3/h and DUT is -20 °C a setting is obtained, at a pump pressure (= pressure drop coil circuit) of 3.3 mvp (33 kPa), of 2.8 on the trim valve.

This means the trim valve should be opened 2.8 turns from the closed position. At the same time it can be read that the coil supplies the supply air with approximately 3kW of additional output at -20°C

NOTE

Vent the coil using the venting screw (QM21) repeatedly in order to ensure the circulation through the coil.

Commissioning without fans

The heat pump can be run without recovery, as only an electric boiler, to produce heat and hot water, for example before the ventilation installation is complete.

Enter menu 4.2 - "op. mode" and select "add. heat only".

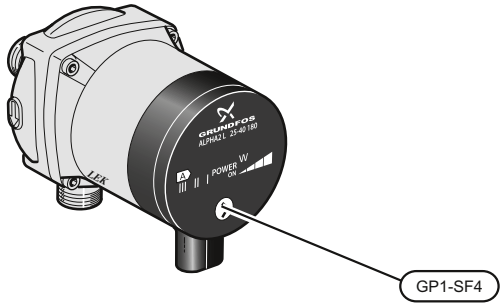
Then enter menu 5.1.5 - "fan sp. exhaust air" and reduce the fan speed to 0%. Also go to menu 5.1.6 - "fan sp. supply air" and reduce the fan speed on the supply air fan to 0%.

NOTE

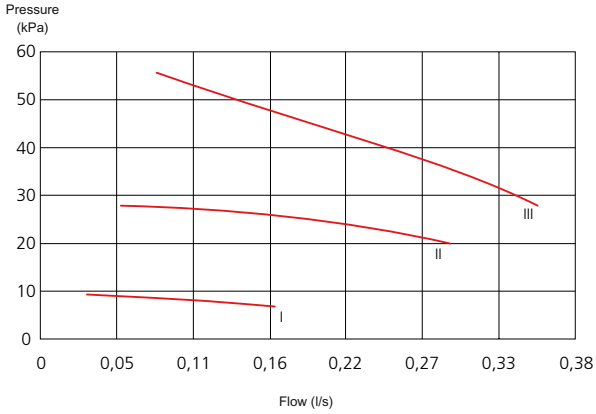
Select operating mode "auto" or "manual" when the heat pump is to run on recovery again.

Setting the pump speed

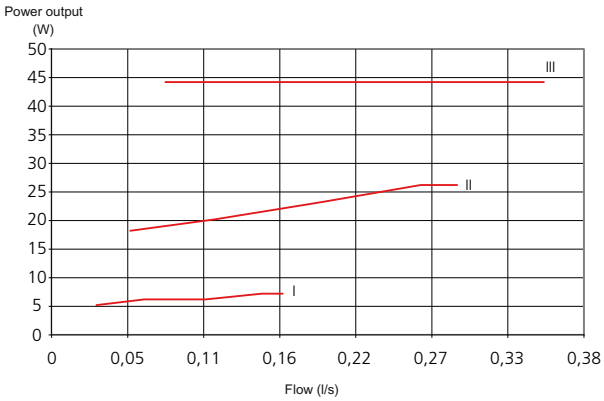
The speed of the circulation pump (GP1) is set using the switch (GP1-SF4) on the pump so that it achieves the projected flow for the house.



Capacity circulation pump



Output circulation pump

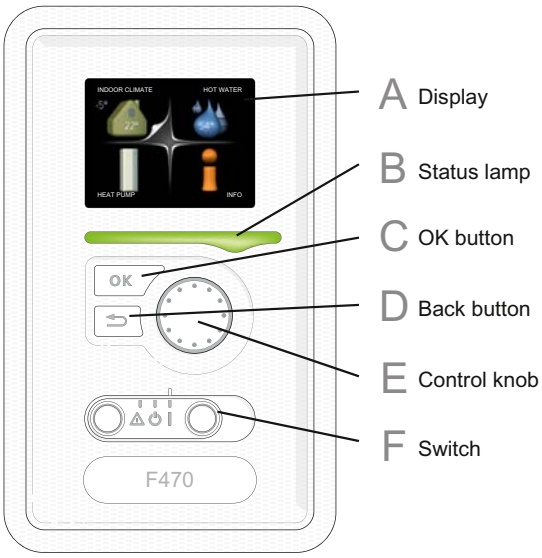


Post-adjustment, venting

Air is initially released from the hot water and venting may be necessary. If gurgling sounds can be heard from the heat pump or climate system, the entire system will require additional venting. Vent the heat pump through venting valve (QM20), and through the supply air coil's venting valve(QM21). When venting, F470 must be off.

7 Control - Introduction

Display unit



A Display

Instructions, settings and operational information are shown on the display. The easy-to-read display and menu system, facilitates navigation between the different menus and options to set the comfort or obtain the information you require.

B Status lamp

The status lamp indicates the status of the heat pump. It:

- lights green during normal operation.
- lights yellow in emergency mode.
- lights red in the event of a deployed alarm.

C OK button

The OK button is used to:

- confirm selections of sub menus/options/set values/page in the start guide.

D Back button

The back button is used to:

- go back to the previous menu.
- change a setting that has not been confirmed.

E Control knob

The control knob can be turned to the right or left. You can:

- scroll in menus and between options.
- increase and decrease the values.
- change page in multiple page instructions (for example help text and service info).

F Switch (SF1)

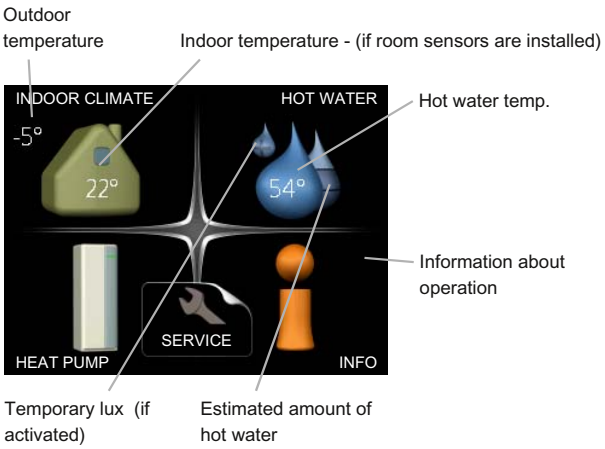
The switch assumes three positions:

- On (I)
- Standby (⏻)
- Emergency mode (⚠) (see page 52)

Emergency mode must only be used in the event of a fault on the heat pump. In this mode, the compressor and fans switch off and the immersion heater engages. The heat pump display is not illuminated and the status lamp illuminates yellow.

Menu system

When the door to the heat pump is opened, the menu system's four main menus are shown in the display as well as certain basic information.



Menu 1 - INDOOR CLIMATE

Setting and scheduling the indoor climate. See page 34.

Menu 2 - HOT WATER

Setting and scheduling hot water production. See page 41.

Menu 3 - INFO

Display of temperature and other operating information and access to the alarm log. See page 43.

Menu 4 - HEAT PUMP

Setting time, date, language, display, operating mode etc. See page 44.

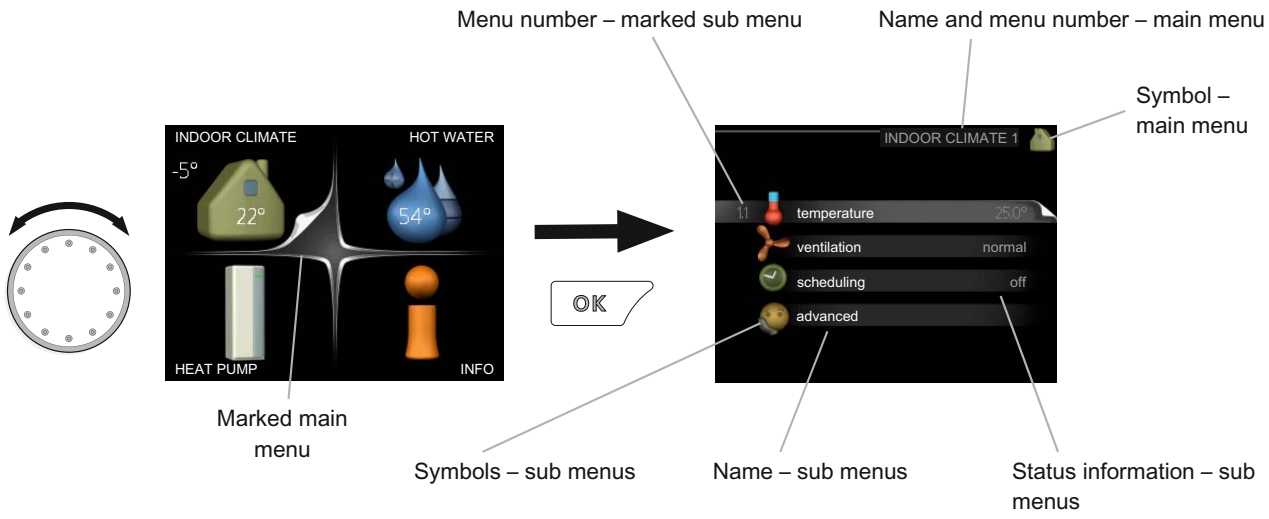
Menu 5 - SERVICE

Advanced settings. These settings are not available to the end user. The menu is visible by pressing the Back button for 7 seconds. See page 48.

Symbols in the display

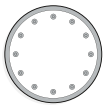
The following symbols can appear in the display during operation.

Symbol	Description
	This symbol appears by the information sign if there is information in menu 3.1 that you should note.
	These two symbols indicate whether the compressor or addition is blocked in F470. These can, for example, be blocked depending on which operating mode is selected in menu 4.2, if blocking is scheduled in menu 4.9.5 or if an alarm has occurred that blocks one of them. Blocking the compressor. Blocking additional heat.
	This symbol appears if lux mode for the hot water is activated.
	This symbol indicates the actual speed of the fan if the speed has changed from the normal setting.
	This symbol indicates whether F470 has contact with NIBE Uplink™.
	This symbol indicates whether solar heating is active. Accessory needed.
	This symbol indicates whether "holiday setting" is activated in menu 4.7.



Operation

To move the cursor, turn the control knob to the left or the right. The marked position is brighter and/or has a turned up tab.

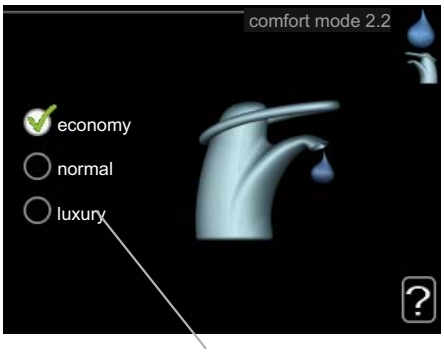


Selecting menu

To advance in the menu system select a main menu by marking it and then pressing the OK button. A new window then opens with sub menus.

Select one of the sub menus by marking it and then pressing the OK button.

Selecting options



Alternative

In an options menu the current selected option is indicated by a green tick.

To select another option:

1. Mark the applicable option. One of the options is pre-selected (white).
2. Press the OK button to confirm the selected option. The selected option has a green tick.

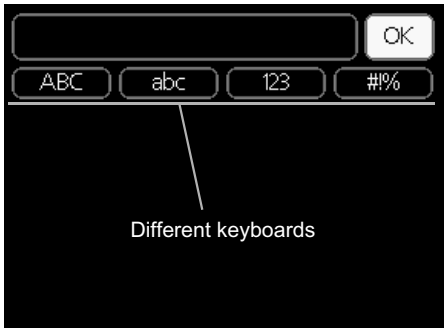
Setting a value

Values to be changed

To set a value:

1. Mark the value you want to set using the control knob.
2. Press the OK button. The background of the value becomes green, which means that you have accessed the setting mode.
3. Turn the control knob to the right to increase the value and to the left to reduce the value.
4. Press the OK button to confirm the value you have set. To change and return to the original value, press the Back button.

Use the virtual keyboard



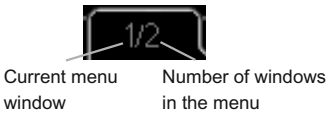
In some menus where text may require entering, a virtual keyboard is available.

Depending on the menu, you can gain access to different character sets which you can select using the control knob. To change character table, press the Back button. If a menu only has one character set the keyboard is displayed directly.

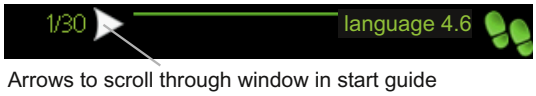
When you have finished writing, mark "OK" and press the OK button.

Scroll through the windows

A menu can consist of several windows. Turn the control knob to scroll between the windows.



Scroll through the windows in the start guide



1. Turn the control knob until one of the arrows in the top left corner (at the page number) has been marked.
2. Press the OK button to skip between the steps in the start guide.

Help menu

In many menus there is a symbol that indicates that extra help is available.

To access the help text:

1. Use the control knob to select the help symbol.
2. Press the OK button.

The help text often consists of several windows that you can scroll between using the control knob.

8 Control - Menus

Menu 1 - INDOOR CLIMATE

Overview

1 - INDOOR CLIMATE	1.1 - temperature	
	1.2 - ventilation	
	1.3 - scheduling	1.3.1 - heating
		1.3.3 - ventilation
	1.9 - advanced	1.9.1 - heating curve
		1.9.2 - external adjustment
		1.9.3 - min. flow line temp.
		1.9.4 - room sensor settings
		1.9.6 - fan return time
		1.9.7 - own curve
		1.9.8 - point offset
		1.9.9 - night cooling

Sub-menus

For the menu INDOOR CLIMATE there are several sub-menus. Status information for the relevant menu can be found on the display to the right of the menus.

temperature Setting the temperature for the climate system. The status information shows the set values for the climate system.

ventilation Setting the fan speed. The status information shows the selected setting.

scheduling Scheduling heating and ventilation. Status information "set" is displayed if you set a schedule but it is not active now, "holiday setting" is displayed if the vacation schedule is active at the same time as the schedule (the vacation function is prioritised), "active" displays if any part of the schedule is active, otherwise it displays "off".

advanced Setting of heat curve, adjusting with external contact, minimum value for supply temperature, room sensor and night cooling.

Menu 1.1 - temperature

If the house has several climate systems, this is indicated on the display by a thermometer for each system.

Set the temperature (with room sensors installed and activated):

Setting range: 5 - 30 °C

Default value: 20

The value in the display appears as a temperature in °C if the heating system is controlled by a room sensor.

To change the room temperature, use the control knob to set the desired temperature in the display. Confirm the new setting by pressing the OK button. The new temperature is shown on the right-hand side of the symbol in the display.

Setting the temperature (without room sensors activated):

Setting range: -10 to +10

Default value: -1

The display shows the set values for heating (curve offset). To increase or reduce the indoor temperature, increase or reduce the value on the display.

Use the control knob to set a new value. Confirm the new setting by pressing the OK button.

The number of steps the value has to be changed to achieve a degree change of the indoor temperature depends on the heating installation. One step is usually enough but in some cases several steps may be required.

Setting the desired value. The new value is shown on the right-hand side of the symbol in the display.

Caution

An increase in the room temperature can be slowed by the thermostats for the radiators or under floor heating. Therefore, open the thermostats fully, except in those rooms where a cooler temperature is required, e.g. bedrooms.

If the exhaust air temperature falls below 16 °C, the compressor is blocked and the electrical addition is permitted to intervene. When the compressor is blocked heat is not recovered from the exhaust air.

TIP

Wait 24 hours before making a new setting, so that the room temperature has time to stabilise.

If it is cold outdoors and the room temperature is too low, increase the curve slope in menu 1.9.1 by one increment.

If it is cold outdoors and the room temperature is too high, lower the curve slope menu 1.9.1 by one increment.

If it is warm outdoors and the room temperature is too low, increase the value in menu 1.1 by one increment.

If it is warm outdoors and the room temperature is too high, reduce the value in menu 1.1 by one increment.

Menu 1.2 - ventilation

Setting range: normal and speed 1-4

Default value: normal

The ventilation in the accommodation can be temporarily increased or reduced here.

When you have selected a new speed a clock starts a count down. When the time has counted down the ventilation speed returns to the normal setting.

If necessary, the different return times can be changed in menu 1.9.6.

The fan speed is shown in brackets (in percent) after each speed alternative.

TIP

If longer time changes are required use the holiday function or scheduling.

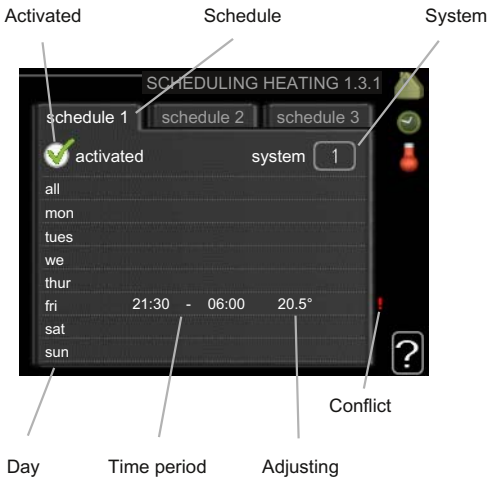
Menu 1.3 - scheduling

In the menu scheduling indoor climate (heating/ventilation) is scheduled for each weekday.

You can also schedule a longer period during a selected period (vacation) in menu 4.7.

Menu 1.3.1 - heating

Increases or decreases in the accommodation temperature can be scheduled here for up to three time periods per day. If a room sensor is installed and activated the desired room temperature (°C) is set during the time period. Without an activated room sensor the desired change is set (of setting in menu 1.1). One step is usually enough to change the room temperature by one degree, but in some cases several steps may be required.



Schedule: The schedule to be changed is selected here.

Activated: Scheduling for the selected period is activated here. Set times are not affected at deactivation.

System: Which climate system the schedule is for is selected here. This alternative is only displayed if more than one climate system is present.

Day: Select which day or days of the week the schedule is to apply to here. To remove the scheduling for a particular day, the time for that day must be reset by setting the start time to the same as the stop time. If the line "all" is used, all days in the period are set for these times.

Time period: The start and stop time for the selected day for scheduling are selected here.

Adjusting: How much the heating curve is to be offset in relation to menu 1.1 during scheduling is set here. If the rooms sensor is installed the desired room temperature is set in °C.

Conflict: If two settings conflict with each other a red exclamation mark is displayed.

TIP

If you wish to set similar scheduling for every day of the week start by filling in “all” and then changing the desired days.

Caution

If the stop time is before the start time it means that the period extends past midnight. Scheduling always starts on the date that the start time is set for.

Changes of temperature in accommodation take time. For example, short time periods in combination with underfloor heating will not give a noticeable difference in room temperature.

If the exhaust air temperature falls below 16 °C, the compressor is blocked and the electrical addition is permitted to intervene. When the compressor is blocked heat is not recovered from the exhaust air.

Menu 1.3.3 - ventilation

Increases or decreases in the ventilation to the accommodation can be scheduled here for up to two time periods per day.

Schedule: The schedule to be changed is selected here.

Activated: Scheduling for the selected period is activated here. Set times are not affected at deactivation.

Day: Select which day or days of the week the schedule is to apply to here. To remove the scheduling for a particular day, the time for that day must be reset by setting the start time to the same as the stop time. If the line "all" is used, all days in the period are set for these times.

Time period: The start and stop time for the selected day for scheduling are selected here.

Adjusting: The desired fan speed is set here.

Conflict: If two settings conflict with each other a red exclamation mark is displayed.

TIP

If you wish to set similar scheduling for every day of the week start by filling in “all” and then changing the desired days.

Caution

If the stop time is before the start time it means that the period extends past midnight. Scheduling always starts on the date that the start time is set for.

A significant change over a longer period of time may cause poor indoor environment and worse operating economy.

Menu 1.9 - advanced

Menu advanced has orange text and is intended for the advanced user. This menu has several sub-menus.

heating curve Setting the heating curve slope.

external adjustment Setting the heat curve offset when the external contact is connected.

min. flow line temp. Setting minimum permitted flow line temperature.

room sensor settings Settings regarding the room sensor.

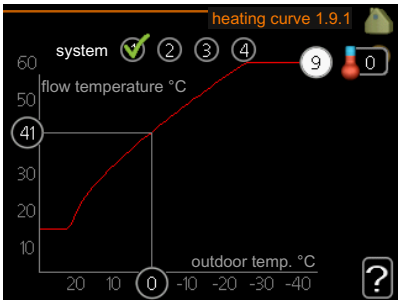
fan return time Fan return time settings in the event of temporary ventilation speed change.

own curve Setting own heat curve.

point offset Setting the offset of the heating curve at a specific outdoor temperature.

night cooling Setting night cooling.

Menu 1.9.1 - heating curve



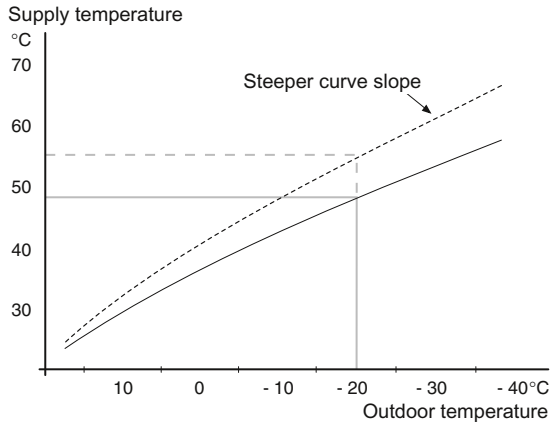
heating curve

Setting range: 0 - 15

Default value: 5

In the menu heating curve the so-called heating curve for your house can be viewed. The task of the heating curve is to give an even indoor temperature, regardless of the outdoor temperature, and thereby energy efficient operation. It is from this heating curve that the heat pump’s control computer determines the temperature of the water to the heating system, flow line temperature, and therefore the indoor temperature. You can select heating curve and read off how the flow line temperature changes at different outdoor temperatures here.

Curve coefficient



The slope of the heating curve indicates how many degrees the supply temperature is to be increased/reduced when the outdoor temperature drops/increases. A steeper slope means a higher supply temperature at a certain outdoor temperature.

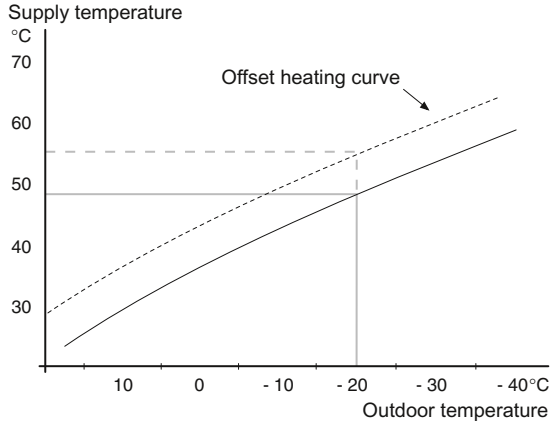
The optimum slope depends on the climate conditions in your location, if the house has radiators or under floor heating and how well insulated the house is.

The heating curve is set when the heating installation is installed, but may need adjusting later. Thereafter the heating curve should not need further adjustment.

Caution

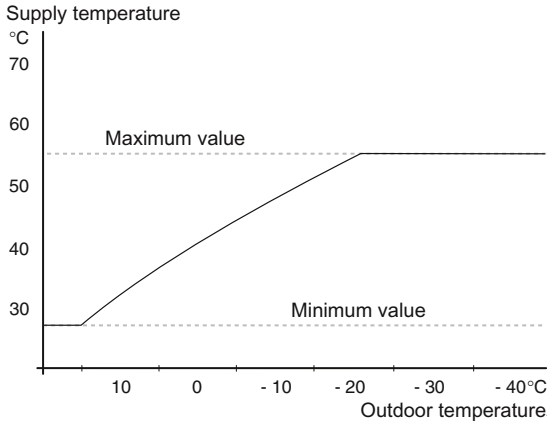
In the event of making fine adjustments for the indoor temperature, the heat curve must be offset up or down instead, this is done in menu 1.1 temperature.

Curve offset



An offset of the heating curve means that the supply temperature changes as much for all the outdoor temperatures, e.g. that a curve offset of +2 steps increases the supply temperature by 5 °C at all outdoor temperatures.

Flow line temperature– maximum and minimum values



Because the flow line temperature cannot be calculated higher than the set maximum value or lower than the set minimum value the heating curve flattens out at these temperatures.

Caution

Underfloor heating systems are normally max flow line temperature set between 35 and 45 °C.

Check the max temperature for your floor with your installer/floor supplier.

The figure at the end of the curve indicates the curve slope. The figure beside the thermometer gives the curve offset. Use the control knob to set a new value. Confirm the new setting by pressing the OK button.

Curve 0 is an own heating curve created in menu 1.9.7.

To select another heat curve (slope):

NOTE

If you only have one heating system, the number of the curve is already marked when the menu window opens.

1. Select the system (if more than one) for which the heat curve is to be changed.
2. When the system selection has been confirmed the heat curve number is marked.
3. Press the OK button to access the setting mode
4. Select a new heating curve. The heat curves are numbered from 0 to 15, the greater the number, the steeper the slope and the greater the supply temperature. Heating curve 0 means that own curve (menu 1.9.7) is used.
5. Press the OK button to exit the setting.

To read off a heating curve:

1. Turn the control knob so that the ring on the shaft with the outdoor temperature is marked.
2. Press the OK button.
3. Follow the grey line up to the heat curve and out to the left to read off the value for the supply temperature at the selected outdoor temperature.

4. You can now select to take read outs for different outdoor temperatures by turning the control knob to the right or left and read off the corresponding flow temperature.
5. Press the OK or Back button to exit read off mode.

TIP

Wait 24 hours before making a new setting, so that the room temperature has time to stabilise.

If it is cold outdoors and the room temperature is too low, increase the curve slope by one increment.

If it is cold outdoors and the room temperature is too high, lower the curve slope by one increment.

If it is warm outdoors and the room temperature is too low, increase the curve offset by one increment.

If it is warm outdoors and the room temperature is too high, lower the curve offset by one increment.

Basic values for the automatic heating control

The values stated on the map apply for the "heating curve" in menu 1.9.1.

- The first value applies for low temperature* radiator systems. "temperature" (heating curve offset) in menu 1.1 must be set to -2.
- The value in brackets refers to under floor heating systems** installed in concrete floor structures.
- When the system is installed in a timber floor structure you can use the number before the brackets, but this value must be reduced by two units. "temperature" (heating curve offset) in menu 1.1, set in these cases to -1.

Caution

The map values are usually a good starting point and concern an approximate room temperature of 20 °C. The values can be adjusted later if necessary.

Examples of basic values selection:

- House with low temperature* radiator system

  London = Area 15 (8).

  Set 15 in menu 1.9.1, "heating curve" and -2 in menu 1.1 "temperature" (heating curve offset).
- House with under floor heating** installed in a concrete floor structure

  London = Area 15 (8).

  Set 8 in menu 1.9.1, "heating curve" and -2 in menu 1.1 "temperature" (heating curve offset).
- Houses with under floor heating** installed in a timber floor structure

  London = Area 15 (8).

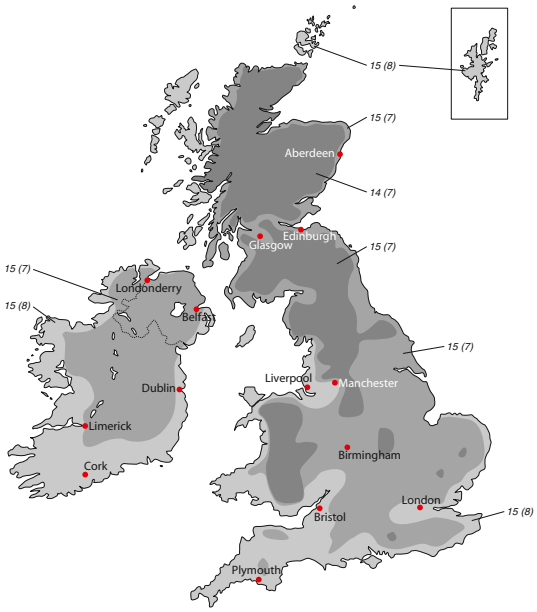
  Set 13 (see third point in the list above) in menu 1.9.1, "heating curve" and -1 in menu 1.1 "temperature" (heating curve offset).

Caution

An increase in the room temperature can be slowed by the thermostats for the radiators or under floor heating. Therefore, open the thermostat valves fully, except in those rooms where a cooler temperature is required, e.g. bedrooms.

A low temperature radiator system refers to a system where the flow temperature needs to be 55 °C on the coldest day.

** Under floor heating can be dimensioned very differently. The example above refers to a system where the flow temperature must be approx 35-40 °C resp. 45-50 °C on the coldest day.



Menu 1.9.2 - external adjustment

climate system

Setting range: -10 to +10 or desired room temperature if the room sensor is installed.

Default value: 0

Connecting an external contact, for example, a room thermostat or a timer allows you to temporarily or periodically raise or lower the room temperature. When the contact is on, the heat curve offset is changed by the number of steps selected in the menu. If a room sensor is installed and activated the desired room temperature (°C) is set.

If there is more than one climate system the setting can be made separately for each system.

Menu 1.9.3 - min. flow line temp.

climate system

Setting range: 20-70 °C

Default value: 20 °C

Set the minimum temperature on the supply temperature to the climate system. This means that F470 never calculates a temperature lower than that set here.

If there is more than one climate system the setting can be made separately for each system.

TIP

The value can be increased if you have, for example, a cellar that you always want to heat, even in summer.

You may also need to increase the value in "stop heating" menu 4.9.2 "auto mode setting".

Menu 1.9.4 - room sensor settings

factor system

Setting range: 0.0 - 6.0

Default value: 2.0

Room sensors to control the room temperature can be activated here.

Here you can set a factor that determines how much the supply temperature is to be affected by the difference between the desired room temperature and the actual room temperature. A higher value gives a greater change of the heating curve's set offset.

If several climate systems are installed the above settings can be made for the relevant systems.

Menu 1.9.6 - fan return time

speed 1-4

Setting range: 1 – 99 h

Default value: 4 h

Here you select the return time for temporary speed change (speed 1-4) on the ventilation in menu 1.2.

Return time is the time it takes before ventilation speed returns to normal.

Menu 1.9.7 - own curve

supply temperature

Setting range: 0 – 80 °C

You can create your own heating curve here, if there are special requirements, by setting the desired supply temperatures for different outdoor temperatures.

Caution

Curve 0 in menu 1.9.1 must be selected for this curve to apply.

Menu 1.9.8 - point offset

outdoor temp. point

Setting range: -40 – 30 °C

Default value: 0 °C

change in curve

Setting range: -10 – 10 °C

Default value: 0 °C

Select a change in the heating curve at a certain outdoor temperature here. One step is usually enough to change the room temperature by one degree, but in some cases several steps may be required.

The heat curve is affected at ± 5 °C from set outdoor temp. point.

It is important that the correct heating curve is selected so that the room temperature is experienced as even.

TIP

If it is cold in the house, at, for example -2 °C, "outdoor temp. point" is set to "-2" and "change in curve" is increased until the desired room temperature is maintained.

Caution

Wait 24 hours before making a new setting, so that the room temperature has time to stabilise.

Menu 1.9.9 - night cooling

start temp. exhaust air

Setting range: 20 – 30 °C

Default value: 25 °C

min diff. outdoor-exhaust

Setting range: 3 – 10 °C

Default value: 6 °C

Activate night cooling here.

When the temperature in the house is high and the outdoor temperature is lower, a cooling effect can be obtained by forcing the ventilation.

If the temperature difference between the exhaust air and the outdoor air temperature is greater than the set value ("min diff. outdoor-exhaust") and the exhaust air temperature is higher than the set value ("start temp. exhaust air") run the ventilation at speed 4 until one of the conditions is no longer met.

Caution

Night cooling can only be activated when house heating has been deactivated. This is done in menu 4.2.

Menu 2 - HOT WATER

Overview

2 - HOT WATER	2.1 - temporary lux	
	2.2 - comfort mode	
	2.3 - scheduling	
	2.9 - advanced	2.9.1 - periodic increases
		2.9.2 - hot water recirc. *

* Accessory needed.

Sub-menus

For the menu HOT WATER there are several sub-menus. Status information for the relevant menu can be found on the display to the right of the menus.

temporary lux Activation of temporary increase in the hot water temperature. Status information displays "off" or what length of time of the temporary temperature increase remains.

comfort mode Setting hot water comfort. The status information displays what mode is selected, "economy", "normal" or "luxury".

scheduling Scheduling hot water comfort. Status information "set" displays if any part of the schedule is active at present, "holiday setting" displays if vacation setting is in progress (menu 4.7), otherwise it displays "off".

advanced Setting periodic increase in the hot water temperature.

Menu 2.1 - temporary lux

Setting range: 3, 6 and 12 hours and mode "off"

Default value: "off"

When hot water requirement has temporarily increased this menu can be used to select an increase in the hot water temperature to lux mode for a selectable time.

Caution

If comfort mode "luxury" is selected in menu 2.2 no further increase can be carried out.

The function is activated immediately when a time period is selected and confirmed using the OK button. The remaining time for the selected setting is shown to the right.

When the time has run out F470 returns to the mode set in menu 2.2.

Select "off" to switch off temporary lux.

Menu 2.2 - comfort mode

Setting range: economy, normal, luxury

Default value: normal

The difference between the selectable modes is the temperature of the hot tap water. Higher temperature means that the hot water lasts longer.

economy: This mode gives less hot water than the other, but is more economical. This mode can be used in smaller households with a small hot water requirement.

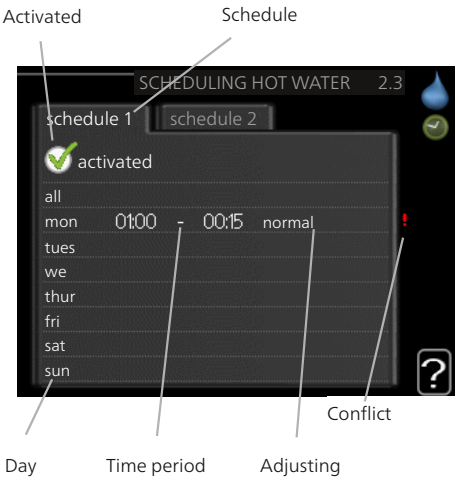
normal: Normal mode gives a larger amount of hot water and is suitable for most households.

luxury: Lux mode gives the greatest possible amount of hot water. In this mode, the immersion heater, as well as the compressor, is used to heat hot water, which may increase operating costs.

Menu 2.3 - scheduling

What hot water comfort the heat pump is to work with can be scheduled here for up to two different time periods per day.

Scheduling is activated/deactivated by ticking/unticking"activated". Set times are not affected at deactivation.



Schedule: The schedule to be changed is selected here.

Activated: Scheduling for the selected period is activated here. Set times are not affected at deactivation.

Day: Select which day or days of the week the schedule is to apply to here. To remove the scheduling for a particular day, the time for that day must be reset by setting the start time to the same as the stop time. If the line "all" is used, all days in the period are set for these times.

Time period: The start and stop time for the selected day for scheduling are selected here.

Adjusting: Set the hot water comfort that is to apply during scheduling here.

Conflict: If two settings conflict with each other a red exclamation mark is displayed.

TIP

If you wish to set similar scheduling for every day of the week start by filling in “all” and then changing the desired days.

Caution

If the stop time is earlier in the day than the start time it means that the period extends past midnight.

Scheduling always starts on the date that the start time is set for.

Menu 2.9 - advanced

Menu advanced has orange text and is intended for the advanced user. This menu has several sub-menus.

Menu 2.9.1 - periodic increases

period

Setting range: 1 - 90 days

Default value: 14 days

start time

Setting range: 00:00 - 23:00

Default value: 00:00

To prevent bacterial growth in the water heater, the compressor and the immersion heater can increase the hot water temperature for a short time at regular intervals.

The length of time between increases can be selected here. The time can be set between 1 and 90 days. Factory setting is 14 days. Untick "activated" to switch off the function.

Menu 2.9.2 - hot water recirc.

operating time

Setting range: 1 - 60 min

Default value: 60 min

downtime

Setting range: 0 - 60 min

Default value: 0 min

Set the hot water circulation for up to three periods per day here. During the set periods the hot water circulation pump will run according to the settings above.

"operating time" decide how long the hot water circulation pump must run per operating instance.

"downtime" decide how long the hot water circulation pump must be stationary between operating instances.

Menu 3 - INFO

Overview

3 - INFO	3.1 - service info
	3.2 - compressor info
	3.3 - add. heat info
	3.4 - alarm log
	3.5 - indoor temp. log

Sub-menus

For the menu INFO there are several sub-menus. No settings can be made in these menus, they just display information. Status information for the relevant menu can be found on the display to the right of the menus.

service info shows temperature levels and settings in the installation.

compressor info shows operating times, number of starts etc for the compressor in the heat pump.

add. heat info displays information about the addition's operating times etc.

alarm log displays the latest alarm and information about the heat pump when the alarm occurred.

indoor temp. log the average temperature indoors week by week during the past year.

Menu 3.1 - service info

Information about the heat pump's actual operating status (e.g. current temperatures etc.) can be obtained here. No changes can be made.

The information is on several pages. Turn the control knob to scroll between the pages.

Symbols in this menu:

Compressor

Heating

Addition

Hot water

Circulation pump, climate system

Ventilation

Menu 3.2 - compressor info

Information about the compressor's operating status and statistics can be obtained here. No changes can be made.

The information is on several pages. Turn the control knob to scroll between the pages.

Menu 3.3 - add. heat info

Information about the additional heat settings, operating status and statistics can be obtained here. No changes can be made.

The information is on several pages. Turn the control knob to scroll between the pages.

Menu 3.4 - alarm log

To facilitate fault-finding the heat pump operating status at alarm alerts is stored here. You can see information for the 10 most recent alarms.

To view the run status in the event of an alarm, mark the alarm and press the OK button.

Menu 3.5 - indoor temp. log

Here you can see the average temperature indoors week by week during the past year. The dotted line indicates the annual average temperature.

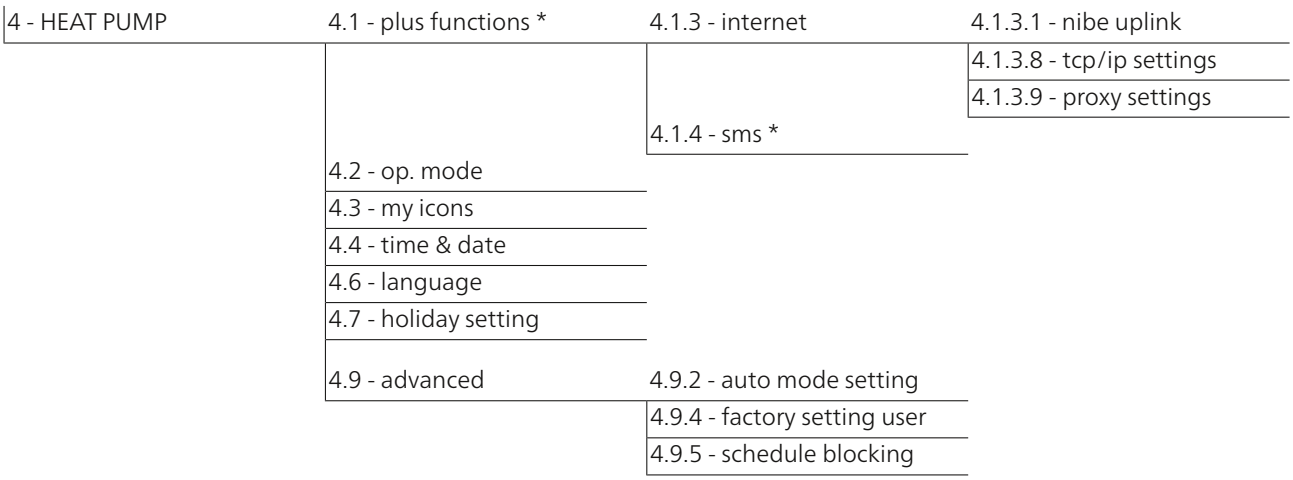
The average outdoor temperature is only shown if a room temperature sensor/room unit is installed. Otherwise, the exhaust air temperature is shown.

To read off an average temperature

1. Turn the control knob so that the ring on the shaft with the week number is marked.
2. Press the OK button.
3. Follow the grey line up to the graph and out to the left to read off the average indoor temperature at the selected week.
4. You can now select to take read outs for different weeks by turning the control knob to the right or left and read off the average temperature.
5. Press the OK or Back button to exit read off mode.

Menu 4 - HEAT PUMP

Overview


4 - HEAT PUMP
4.1 - plus functions *
4.1.3 - internet
4.1.3.1 - nibe uplink
4.1.3.8 - tcp/ip settings
4.1.3.9 - proxy settings
4.1.4 - sms *
4.2 - op. mode
4.3 - my icons
4.4 - time & date
4.6 - language
4.7 - holiday setting
4.9 - advanced
4.9.2 - auto mode setting
4.9.4 - factory setting user
4.9.5 - schedule blocking

* Accessory needed.

Sub-menus

For the menu HEAT PUMP there are several sub-menus. Status information for the relevant menu can be found on the display to the right of the menus.

plus functions Settings applying to any installed extra functions in the heating system.

op. mode Activation of manual or automatic operating mode. The status information shows the selected operating mode.

my icons Settings regarding which icons in the heat pump's user interface that are to appear in the slot when the door is closed.

time & date Setting current time and date.

language Select the language for the display here. The status information shows the selected language.

holiday setting Vacation scheduling heating, hot water and ventilation. Status information "set" is displayed if you set a vacation schedule but it is not active at the moment, "active" is displayed if any part of the vacation schedule is active, otherwise it displays " off".

advanced Setting heat pump work mode.

Menu 4.1 - plus functions

Settings for any additional functions installed in F470 can be made in the sub menus.

Menu 4.1.3 - internet

Here you make settings for connecting F470 to the internet.

NOTE

For these functions to work the network cable must be connected.

Menu 4.1.3.1 - nibe uplink

Here you can manage the installation's connection to NIBE Uplink™ (http://www.nibeuplink.com) and see the number of users connected to the installation via the internet.

A connected user has a user account in NIBE Uplink™ which have been given permission to control and/or monitor your installation.

Request new connection string

To connect a user account on NIBE Uplink™ to your installation, you must request a unique connection string.

1. Mark “request new connection string" and press the OK button.
2. The installation now communicates with NIBE Uplink™ to create a connection string.
3. When a connection string has been received, it is shown in this menu at "connection string" and is valid for 60 minutes.

Disconnect all users

1. Mark “switch off all users" and press the OK button.
2. The installation now communicates with NIBE Uplink™ to release your installation from all connected users via the internet.

NOTE

After disconnecting all users none of them can monitor or control your installation via NIBE Uplink™ without requesting a new connection string.

Menu 4.1.3.8 - tcp/ip settings

You can set TCP/IP settings for your installation here.

Automatic setting (DHCP)

1. Tick “automatic". The installation now receives the TCP/IP settings using DHCP.
2. Mark “confirm" and press the OK button.

Manual setting

1. Untick "automatic", you now have access to several setting options.

2. Mark “ip-address" and press the OK button.
3. Enter the correct details via the virtual keypad.
4. Mark “OK" and press the OK button.
5. Repeat 1 - 3 for "net mask", "gateway" and "dns".
6. Mark “confirm" and press the OK button.

Caution

The installation cannot connect to the internet without the correct TCP/IP settings. If unsure about applicable settings use the automatic mode or contact your network administrator (or similar) for further information.

TIP

All settings made since opening the menu can be reset by marking "reset" and pressing the OK button.

Menu 4.1.3.9 - proxy settings

You can set proxy settings for your installation here.

Proxy settings are used to give connection information to a intermediate server (proxy server) between the installation and Internet. These settings are primarily used when the installation connects to the Internet via a company network. The installation supports proxy authentication of the HTTP Basic and HTTP Digest type.

If unsure about applicable settings use the preset settings or contact your network administrator (or similar) for further information.

Setting

1. Tick “use proxy" if you do not want to use a proxy.
2. Mark “server" and press the OK button.
3. Enter the correct details via the virtual keypad.
4. Mark “OK" and press the OK button.
5. Repeat 1 - 3 for "port", "user name" and "password".
6. Mark “confirm" and press the OK button.

TIP

All settings made since opening the menu can be reset by marking "reset" and pressing the OK button.

Menu 4.1.4 - sms (accessory is required)

Make settings for the accessory SMS 40 here.

Add the mobile numbers that are to have access to change and receive status information from the heat pump. Mobile numbers must include country code e.g. +46 XXXXXXXX.

If you want to receive an SMS message in the event of the alarm mark the box to the right of the telephone number.

NOTE

Telephone numbers provided must be able to receive SMS messages.

Menu 4.2 - op. mode

op. mode

Setting range: auto, manual, add. heat only

Default value: auto

functions

Setting range: compressor, addition, heating

The heat pump operating mode is usually set to "auto". It is also possible to set the heat pump to "add. heat only", but only when an addition is used, or "manual" and select yourself what functions are to be permitted.

Change the operating mode by marking the desired mode and pressing the OK button. When an operating mode is selected it shows what in the heat pump is permitted (crossed out = not permitted) and selectable alternatives to the right. To select selectable functions that are permitted or not you mark the function using the control knob and press the OK button.

Operating mode auto

In this operating mode the heat pump automatically selects what functions are permitted.

Operating mode manual

In this operating mode you can select what functions are permitted. You cannot deselect "compressor" in manual mode.

Operating mode add. heat only

In this operating mode the compressor is not active and only additional heating is used.

Caution

If you choose mode "add. heat only" the compressor is deselected and there is a higher operating cost.

Functions

"**compressor**" is that which produces heating and hot water for the accommodation. If "compressor" is deselected, a symbol in the main menu on the heat pump symbol is displayed. You cannot deselect "compressor" in manual mode.

"**addition**" is what helps the compressor to heat the accommodation and/or the hot water when it cannot manage the whole requirement alone.

"**heating**" means that you get heat in the accommodation. You can deselect the function when you do not wish to have heating running.

Caution

If you deselect "addition" it may mean that insufficient hot water and/or heating in the accommodation is achieved.

Menu 4.3 - my icons

You can select what icon should be visible when the door to F470 is closed. You can select up to 3 icons. If you select more, the ones you selected first will disappear. The icons are displayed in the order you selected them.

Menu 4.4 - time & date

Set time and date, display mode and time zone here.

TIP

Time and date are set automatically if the heat pump is connected to NIBE Uplink™. To obtain the correct time, the time zone must be set.

Menu 4.6 - language

Choose the language that you want the information to be displayed in here.

Menu 4.7 - holiday setting

To reduce energy consumption during a holiday you can schedule a reduction in heating, ventilation and hot water temperature. Solar panel cooling can also be scheduled if the function is connected.

If a room sensor is installed and activated the desired room temperature (°C) is set during the time period. This setting applies to all climate systems with room sensors.

If a room sensor is not activated, the desired offset of the heating curve is set. This setting applies to all climate systems without room sensors. One step is usually enough to change the room temperature by one degree, but in some cases several steps may be required.

Vacation scheduling starts at 00:00 on the start date and stops at 23:59 on the stop date.

TIP

Complete holiday setting about a day before your return so that room temperature and hot water have time to regain usual levels.

TIP

Set the vacation setting in advance and activate just before departure in order to maintain the comfort.

Caution

If you choose to switch off hot water production during the vacation “periodic increases" (preventing bacterial growth) are blocked during this time. "periodic increases" started in conjunction with the vacation setting being completed.

Caution

If the exhaust air temperature falls below 16 °C, the compressor is blocked and the electrical addition is permitted to intervene. When the compressor is blocked heat is not recovered from the exhaust air.

Menu 4.9 - advanced

Menu advanced has orange text and is intended for the advanced user. This menu has several sub-menus.

Menu 4.9.2 - auto mode setting

stop heating

Setting range: -20 – 40 °C

Default values: 20

stop additional heat

Setting range: -25 – 40 °C

Default values: 15

filtering time

Setting range: 0 – 48 h

Default value: 24 h

When operating mode is set to "auto“ the heat pump selects when start and stop of additional heat and heat production is permitted, dependent on the average outdoor temperature.

Select the average outdoor temperatures in this menu.

You can also set the time over which (filtering time) the average temperature is calculated. If you select 0, the present outdoor temperature is used.

Caution

It cannot be set "stop additional heat" higher than "stop heating".

Menu 4.9.4 - factory setting user

All settings that are available to the user (including advanced menus) can be reset to default values here.

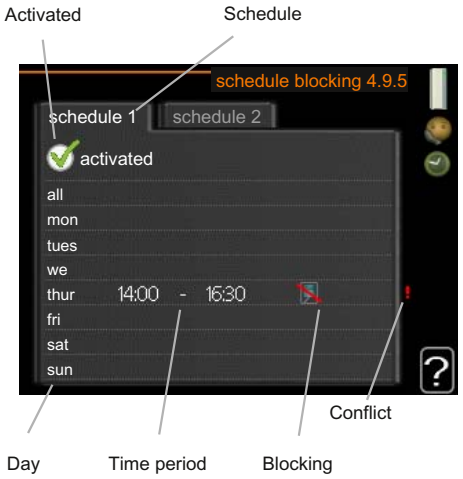
Caution

After factory setting, personal settings such as heating curves, ventilation etc must be reset.

Menu 4.9.5 - schedule blocking

The compressor can be scheduled to be blocked for up to two different time periods here.

When scheduling is active the actual blocking symbol in the main menu on the heat pump symbol is displayed.



Schedule: The period to be changed is selected here.

Activated: Scheduling for the selected period is activated here. Set times are not affected at deactivation.

Day: Select which day or days of the week the schedule is to apply to here. To remove the scheduling for a particular day, the time for that day must be reset by setting the start time to the same as the stop time. If the line "all" is used, all days in the period are set for these times.

Time period: The start and stop time for the selected day for scheduling are selected here.

Blocking: The desired blocking is selected here.

Conflict: If two settings conflict with each other a red exclamation mark is displayed.

Blocking the compressor.

Blocking additional heat.

TIP

If you wish to set similar scheduling for every day of the week start by filling in "all" and then changing the desired days.

Caution

If the stop time is before the start time it means that the period extends past midnight.

Scheduling always starts on the date that the start time is set for.

Caution

Long term blocking can cause reduced comfort and operating economy.

Menu 5 - SERVICE

Overview

5 - SERVICE	5.1 - operating settings	5.1.1 - hot water settings
		5.1.2 - max flow line temperature
		5.1.4 - alarm actions
		5.1.5 - fan sp. exhaust air
		5.1.6 - fan sp. supply air
		5.1.12 - internal electrical addition
		5.1.99 - other settings
	5.2 - system settings	5.2.4 - accessories
	5.3 - accessory settings	5.3.3 - extra climate system *
	5.4 - soft in/outputs	
	5.5 - factory setting service	
	5.6 - forced control	
	5.7 - start guide	
	5.8 - quick start	
	5.9 - floor drying function	
	5.10 - change log	

* Accessory needed.

Hold the Back button in for 7 seconds to access the Service menu.

Sub-menus

Menu SERVICE has orange text and is intended for the advanced user. This menu has several sub-menus. Status information for the relevant menu can be found on the display to the right of the menus.

operating settings Operating settings for the heat pump.

system settings System settings for the heat pump, activating accessories etc.

accessory settings Operational settings for different accessories.

soft in/outputs Setting software controlled in and outputs on the input circuit board (AA3).

factory setting service Total reset of all settings (including settings available to the user) to default values.

forced control Forced control of the different components in the heat pump.

start guide Manual start of the start guide which is run the first time the heat pump is started.

quick start Quick starting the compressor.

NOTE

Incorrect settings in the service menus can damage the heat pump.

Menu 5.1 - operating settings

Operating settings can be made for the heat pump in the sub menus.

Menu 5.1.1 - hot water settings

economy

Setting range start temp. economy: 15 – 52 °C

Factory setting start temp. economy: 45 °C

Setting range stop temp. economy: 15 – 55 °C

Factory setting stop temp. economy: 51 °C

normal

Setting range start temp. normal: 15 - 52 °C

Factory setting start temp. normal: 49 °C

Setting range stop temp. normal: 15 - 55 °C

Factory setting stop temp. normal: 55 °C

luxury

Setting range start temp. lux: 15 – 62 °C

Factory setting start temp. lux: 52 °C

Setting range stop temp. lux: 15 – 65 °C

Factory setting stop temp. lux: 58 °C

stop temp. per. increase

Setting range: 55 – 70 °C

Default values: 60 °C

Here you set the start and stop temperature of the hot water for the different comfort options in menu 2.2 as

well as the stop temperature for periodic increase in menu 2.9.1.

Menu 5.1.2 - max flow line temperature

climate system

Setting range: 20-70 °C

Default value: 60 °C

Set the maximum supply temperature for the climate system here. If the installation has more than one climate system, individual maximum flow temperatures can be set for each system.

Caution

Underfloor heating systems are normally max flow line temperature set between 35 and 45 °C.

Check the max floor temperature with your floor supplier.

Menu 5.1.4 - alarm actions

Select if you want the heat pump to alert you that there is an alarm in the display here.

Caution

If no alarm action is selected, it can result in higher energy consumption in the event of an alarm.

Menu 5.1.5 - fan sp. exhaust air

normal and speed 1-4

Setting range: 0 – 100 %

Set the speed for the five different selectable speeds for the fan here.

Caution

An incorrectly set ventilation flow can damage the house and may also increase energy consumption.

Menu 5.1.6 - fan sp. supply air

normal and speed 1-4

Setting range: 0 – 100 %

Set the speed for the five different selectable speeds for the fan here.

Caution

An incorrectly set value may damage the house in the long term and possibly increase energy consumption.

Menu 5.1.12 - internal electrical addition

set max electrical add.

0 - 8 kW

Default values: 5.3 kW

fuse size

Setting range: 1 - 200 A

Default values: 16 A

Here you set the max. electrical output of the internal electrical addition in F470 and the fuse size for the installation.

Menu 5.1.99 - other settings

trend calculation limit

Setting range: 0 – 20 °C

Default value: 7 °C

transfer time

Setting range: 1 - 60 min

Default value: 15 min

months btwn filter alarms

Setting range: 1 – 12

Default value: 3

Set trend calculation limit, transfer time, months btwn filter alarms and fan synch. operation here.

trend calculation limit

Here you set at what outdoor temperature the trend calculation is to stop. Below this limit trend calculating is not used to enable the additional heat.

transfer time

Here you can set transfer time between heating and hot water production in F470.

months btwn filter alarms

Here you set the number of months between alarms for a reminder to clean the filters in F470.

fan synch. operation

Select whether you want the fan to maintain the same speed regardless of whether the compressor is operating or not, alternatively different speeds. If the function is activated, fan speed 2 applies when the compressor is not in operation, and fan speed normal when the compressor is in operation.

Menu 5.2 - system settings

Make different system settings for the heat pump here, e.g. which accessories are installed.

Menu 5.2.4 - accessories

Inform the heat pump which accessories are installed here.

There are two ways of activating connected accessories. You can either mark the alternative in the list or use the automatic function "search installed acc.".

search installed acc.

Mark “search installed acc." and press the OK button to automatically find connected accessories for F470.

Menu 5.3 - accessory settings

The operating settings for accessories that are installed and activated are made in the sub-menus for this.

Menu 5.3.3 - extra climate system

mixing valve amplifier

Setting range: 0.1 –10.0

Default value: 1.0

mixing valve step delay

Setting range: 10 – 300 s

Default values: 30 s

Set the shunt amplification and shunt waiting time for the different extra climate systems that are installed.

See the accessory installation instructions for function description.

Menu 5.4 - soft in/outputs

Here you can select which in/output on the input circuit board (AA3) the external contact function (page 23) is to be connected to.

Selectable inputs on terminal block AUX1-5 (AA3-X6:9-18) and output AA3-X7 (on the input circuit board).

Menu 5.5 - factory setting service

All settings can be reset (including settings available to the user) to default values here.

NOTE

When resetting, the start guide is displayed the next time the heat pump is restarted.

Menu 5.6 - forced control

You can force control the different components in the heat pump and any connected accessories here.

Menu 5.7 - start guide

When the heat pump is started for the first time the start guide starts automatically. Start it manually here.

See page 26 for more information about the start guide.

Menu 5.8 - quick start

It is possible to start the compressor from here.

Caution

There must be a heating or hot water demand to start the compressor.

Caution

Do not quick start the compressor too many times in succession over a short period of time as this may damage the compressor and its ancillary equipment.

Menu 5.9 - floor drying function

length of period 1 - 3, 5-7

Setting range: 0 - 30 days

Default value: 2 days

temp. period 1 - 3, 5-7

Setting range: 15 - 70 °C

Default value:

temp. period 1	20 °C
temp. period 2	30 °C
temp. period 3	40 °C
temp. period 5	40 °C
temp. period 6	30 °C
temp. period 7	20 °C

length of period 4

Setting range: 0 - 30 days

Default value: 3 days

temp. period 4

Setting range: 15 - 70 °C

Default value: 45 °C

Set the function for under floor drying here.

You can set up to seven period times with different calculated flow temperatures. If less than seven periods are to be used, set the remaining period times to 0 days.

Mark the active window to activate the under floor drying function. A counter at the bottom shows the number of days the function has been active.

TIP

If operating mode "add. heat only" is to be used, select it in menu 4.2.

Menu 5.10 - change log

Read off any previous changes to the control system here.

The date, time and ID no. (unique to certain settings) and the new set value is shown for every change.

NOTE

The change log is saved at restart and remains unchanged after factory setting.

9 Service

Service actions

NOTE

Servicing should only be carried out by persons with the necessary expertise.

When replacing components on F470 only replacement parts from NIBE may be used.

NOTE

If an electrical connection has been disconnected and is connected, ground must be checked using a suitable multimeter.

NOTE

An immersion heater without a temperature limiter is not allowed to be installed.

NOTE

After servicing, complete the relevant Service Interval Record section of the Benchmark Checklist located at the back of this document.

Completion of the Service Interval Record is a condition of warranty. For full terms and conditions of warranty, please see our website www.nibe.co.uk.

Maintenance

General inspection

Check the following:

1. Condition of casing.
2. Electrical connections.
3. Pipe connections.
4. Alarm log.

Correct any fault before continuing.

Hot water heater

Check the following:

1. Hot water start and stop temperature.
2. Pressure controlled bypass valve.
3. T&P valve.
4. Overflow pipe.
5. Pressure expansion vessel.

Correct any fault before continuing.

Climate system

Check the following:

1. Climate system start and stop temperature.
2. Heating curve settings.
3. Function of the room sensor (if installed).
4. Limiting valve settings.
5. System pressure.
6. Flow and return temperature. The difference must be 5 - 10 °C.

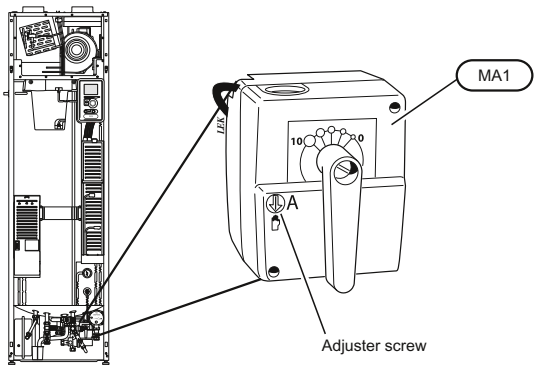
Correct any fault before continuing.

Emergency mode

Emergency mode is used in event of operational interference and in conjunction with service.

Emergency mode is activated by setting switch (SF1) to "⚠". This means that:

- The status lamp illuminates yellow.
- The display is not lit and the control computer is not connected.
- The temperature in the heat pump boiler section is controlled by a fixed thermostat (BT30) at 63 °C.
- The compressor and the fans are off and only the heating medium pump and the electrical addition are active. The electrical addition power in emergency mode is set in the immersion heater card (AA1). See page 22 for instructions.
- The automatic heating control system is not operational, so manual shunt operation is required. This is done by turning the adjustment screw on the shunt motor (MA1) to "manual mode" and then turning the shunt knob to the desired position.



Draining the water heater

The water heater can be drained via the safety valve (FL1) or via the overflow cup (WM1).

1. Disconnect the overflow pipe from the safety valve (FL1) and connect a hose to a draining pump instead. Where no draining pump is available, the water can be released into the overflow cup (WM1).
2. Open the safety valve (FL1).
3. Open a hot water tap to let air into the system. If this is not sufficient, detach the pipe connection (XL4) on the hot water side to see if air is entering.

Draining the climate system

In order to carry out service on the climate system, it may be easier to drain the system first.

NOTE

There may be some hot water when draining the heating medium side/climate system. There is a risk of scalding.

The hot water can be tapped through safety valve (FL2) via the overflow cup (WM1) or through a hose that is

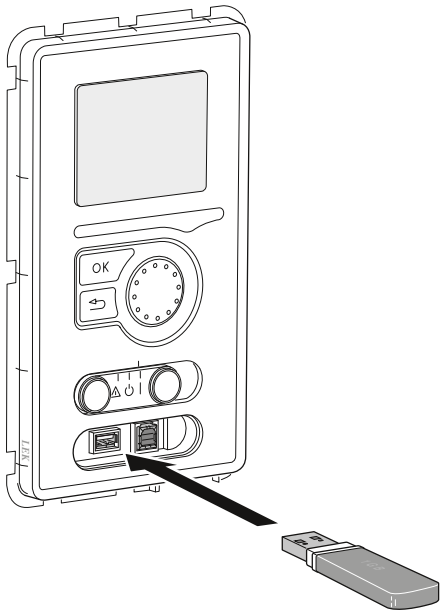
connected to the safety valve's (FL2) or the drain valve's (XL10) outlet.

1. Open the safety valve (FL2) or the drain valve (XL10).
2. Set the vent valve for the climate system (QM20) in the open position for air supply.

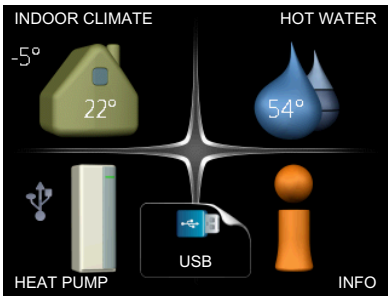
Temperature sensor data

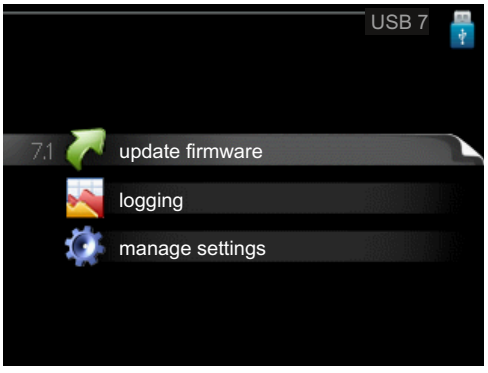
Temperature (°C)	Resistance (kOhm)	Voltage (VDC)
-40	351.0	3.256
-35	251.6	3.240
-30	182.5	3.218
-25	133.8	3.189
-20	99.22	3.150
-15	74.32	3.105
-10	56.20	3.047
-5	42.89	2.976
0	33.02	2.889
5	25.61	2.789
10	20.02	2.673
15	15.77	2.541
20	12.51	2.399
25	10.00	2.245
30	8.045	2.083
35	6.514	1.916
40	5.306	1.752
45	4.348	1.587
50	3.583	1.426
55	2.968	1.278
60	2.467	1.136
65	2.068	1.007
70	1.739	0.891
75	1.469	0.785
80	1.246	0.691
85	1.061	0.607
90	0.908	0.533
95	0.779	0.469
100	0.672	0.414

USB service outlet



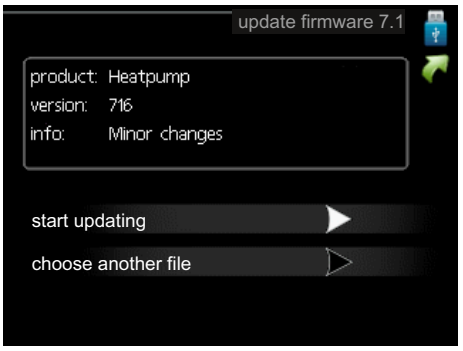
F470 is equipped with a USB socket in the display unit. This USB socket can be used to connect a USB memory to update the software, save logged information and handle the settings in F470.





When a USB memory is connected a new menu (menu 7) appears in the display.

Menu 7.1 - update firmware



This allows you to update the software in F470.

NOTE
For the following functions to work the USB memory must contain files with software for F470 from NIBE.

The fact box at the top of the display shows information (always in English) of the most probable update that the update software has selected form the USB memory.

This information states which product the software is intended for, the software version and general information about them. If you wish to select another file than the one selected, the correct file can be selected by "choose another file".

start updating

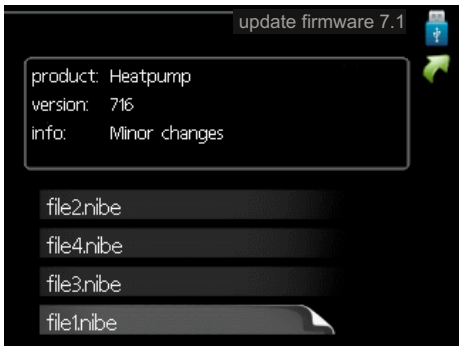
Select "start updating" if you want to start the update. You are asked whether you really want to update the software. Respond "yes" to continue or "no" to undo.

If you responded"yes" to the previous question the update starts and you can now follow the progress of the update on the display. When the update is complete F470 restarts.

NOTE
A software update does not reset the menu settings in F470.

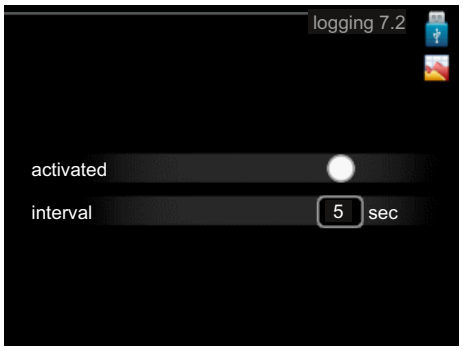
NOTE
If the update is interrupted before it is complete (for example power cut etc.) the software can be reset to the previous version if the OK button is held in during start up until the green lamp starts to illuminate (takes about 10 seconds).

choose another file



Select “choose another file" if you do not want to use the suggested software. When you scroll through the files, information about the marked software is shown in a fact box just as before. When you have selected a file with the OK button you will return to the previous page (menu 7.1) where you can choose to start the update.

Menu 7.2 - logging



Setting range: 1 s – 60 min

Default setting range: 5 s

Set whether the present measurement values from F470 are to be saved in a log on the USB memory.

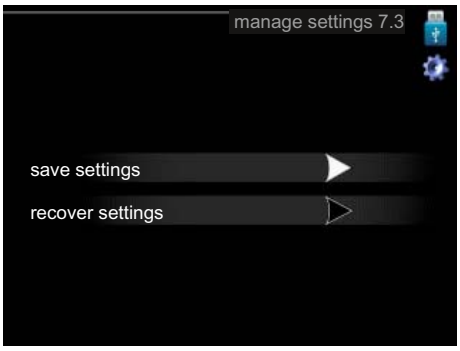
Log for longer periods

1. Set the desired interval between loggings.
2. Tick “activated".
3. The present values from F470 are saved in a file in the USB memory at the set interval until “activated" is unticked.

Caution

Untick "activated" before removing the USB memory.

Menu 7.3 - manage settings



Here you can manage (save as or retrieve from) all the menu settings (user and service menus) in F470 with a USB memory.

Via "save settings" you save the menu settings to the USB memory in order to restore them later or to copy the settings to another F470.

NOTE

When you save the menu settings to the USB memory you replace any previously saved settings on the USB memory.

Via "recover settings" you reset all menu settings from the USB memory.

NOTE

Reset of the menu settings from the USB memory cannot be undone.

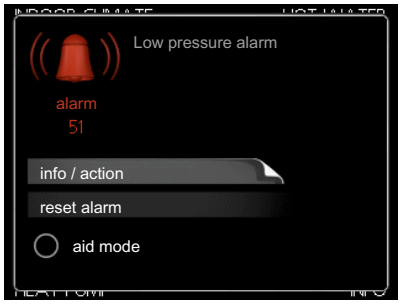
10 Disturbances in comfort

In most cases, the heat pump notes operational interference (operational interference can lead to disturbance in comfort) and indicates this with alarms and shows action instructions in the display.

Info-menu

All the heat pump measurement values are gathered under menu 3.1 in the heat pump menu system. Looking through the values in this menu can often simplify finding the fault source. See page 43 for more information about menu 3.1.

Manage alarm



In the event of an alarm, some kind of malfunction has occurred, which is indicated by the status lamp changing from green continuously to red continuously. In addition, an alarm bell appears in the information window.

Alarm

In the event of an alarm with a red status lamp a malfunction has occurred that the heat pump cannot remedy itself. In the display, by turning the control knob and pressing the OK button, you can see the type of alarm it is and reset it. You can also choose to set the heat pump to aid mode.

info / action Here you can read what the alarm means and receive tips on what you can do to correct the problem that caused the alarm.

reset alarm In most cases it is enough to select "reset alarm" to correct the problem that caused the alarm. If a green light illuminates after selecting "reset alarm" the alarm has been remedied. If a red light is still visible and a menu called "alarm" is visible in the display, the problem that caused the alarm remains. If the alarm disappears and then returns, see the troubleshooting section (page 56).

aid mode "aid mode" is a type of emergency mode. This means that the heat pump produces heat and/or hot water despite there being some kind of problem. This can mean that the heat pump's compressor is not running. In this case the immersion heater produces heat and/or hot water.

Caution

Selecting "aid mode" is not the same as correcting the problem that caused the alarm. The status lamp will therefore continue to be red.

Troubleshooting

If the operational interference is not shown in the display the following tips can be used:

Basic actions

Start by checking the following possible fault sources:

- The switch's (SF1) position.
- Group and main fuses of the accommodation.
- The property's earth circuit breaker.
- The heat pump's miniature circuit breaker (FA1).
- The heat pump's temperature limiter (FD1).

Low hot water temperature or a lack of hot water

- Closed or choked filling valve for the hot water heater.
  - Open the valve.
- Heat pump in incorrect operating mode.
  - Enter menu 4.2. If mode "auto" is selected, select a higher value on "stop additional heat" in menu 4.9.2.
  - If mode "manual" is selected, select "addition".
- Large hot water consumption.
  - Wait until the hot water has heated up. Temporarily increased hot water capacity (temporary lux) can be activated in menu 2.1.
- Too low hot water setting.
  - Enter menu 2.2 and select a higher comfort mode.

Low room temperature

- Closed thermostats in several rooms.
  - See the "Saving tips" section in the User manual for more detailed information about how to best set the thermostats.
- Heat pump in incorrect operating mode.
  - Enter menu 4.2. If mode "auto" is selected, select a higher value on "stop heating" in menu 4.9.2.
  - If mode "manual" is selected, select "heating". If this is not enough, select "addition".
- Too low set value on the automatic heating control.
  - Enter menu 1.1 "temperature" and adjust the offset of the heating curve. If the room temperature is only low in cold weather the curve slope in menu 1.9.1 "heating curve" needs adjusting up.
- "comfort mode" "luxury" selected in combination with large hot water outlet.
  - Enter menu 2.2 and select "economy" or "normal".
- "Holiday mode" activated in menu 4.7.
  - Enter menu 4.7 and select "Off".
- External switch for changing the room heating activated.
  - Check any external switches.
- Air in the heating system.
  - Vent the heating system (see page 25).
- Closed valves (QM31), (QM32)to the heating system.
  - Open the valves.

High room temperature

- Too high set value on the automatic heating control.
  - Enter menu 1.1 (temperature) and adjust the heat curve offset downwards. If the room temperature is only high in cold weather the curve slope in menu 1.9.1 (heating curve) needs to be adjusted down.
- External switch for changing the room heating activated.
  - Check any external switches.
- Trim valve to supply air battery (RN1) not adjusted.
  - Adjust the valve (see diagram on page 28).

Low system pressure

- Not enough water in the heating system.
  - Top up the water in the heating system (see page 25).

Low or a lack of ventilation

- The ventilation is not adjusted.
  - Order/implement ventilation adjustment.
- Filter (HQ10/HQ11) blocked.
  - Clean or replace the filter.
- Exhaust air device blocked or throttled down too much.
  - Check and clean the exhaust air devices.
- Fan speed in reduced mode.
  - Enter menu 1.2 and select “normal".
- External switch for changing the fan speed activated.
  - Check any external switches.

High or distracting ventilation

- The ventilation is not adjusted.
  - Order/implement ventilation adjustment.
- Fan speed in forced mode.
  - Enter menu 1.2 and select “normal".
- External switch for changing the fan speed activated.
  - Check any external switches.
- Filter (HQ10) blocked.
  - Clean or replace the filter.

The compressor does not start

- There is no heating requirement.
  - The heat pump does not call on heating nor hot water.
  - The heat pump defrosts.
- Temperature conditions tripped.
  - Wait until the temperature condition has been reset.
- Minimum time between compressor starts has not been reached.
  - Wait 30 minutes and check if the compressor has started.
- Alarm tripped.
  - Follow the display instructions.

11 Accessories

Base extension EF 45

Part no. 067 152

Communications module SMS 40

SMS 40 enables operation and monitoring of F470, via a GSM module, using a mobile phone via SMS messages. If the mobile telephone also has the Android operating system the mobile application "NIBE Mobile App" can be used.

Part no. 067 073

Docking kit DEH

There are separate docking kits available for connecting other heat sources to the heat pump.

Docking kit wood/oil/pellets DEH 40

Part no. 066 101

Docking kit gas DEH 41

Part no. 066 102

Extra shunt group ECS 40/ECS 41

This accessory is used when F470 is installed in houses with two or more different heating systems that require different supply temperatures.

ECS 40 (Max. 80 m^2)	Part no. 067 287
ECS 41 (Min. 80 m^2)	Part no. 067 288

Room unit RMU 40

RMU 40 means that control and monitoring of the heat pump can be carried out in a different part of the accommodation to where F470 is located.

Part no. 067 064

Solar 41

Solar 41 means that F470 can be connected to solar heating.

Part no. 067 127

Top cabinet

Top cabinet to room height 2400, 2500, 2550-2800 mm.

2400 mm

Part no. 089 756

2500 mm

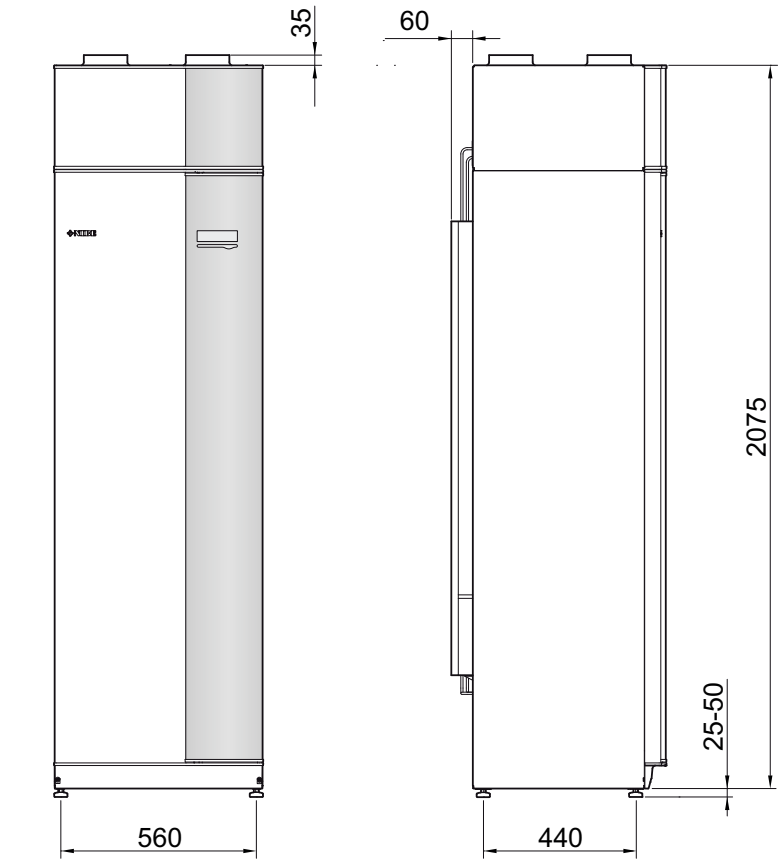
Part no. 089 757

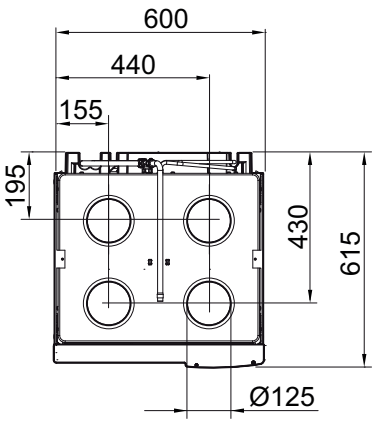
2550-2800 mm

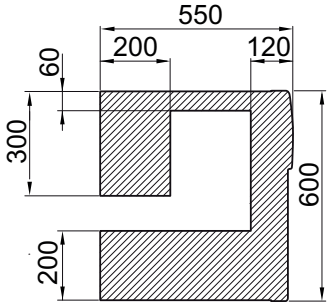
Part no. 089 758

12 Technical data

Dimensions and setting-out coordinates







Avoid routing pipes through the marked area

Technical specifications

CE IP 21

1x230V		
Output data according to EN 14 511		
Specified heating output (P_H)[1]	kW	2.18
COP[1]		3.93
Specified heating output (P_H)[2]	kW	2.03
COP[2]		3.24
Specified heating output (P_H)[3]	kW	1.88
COP[3]		2.74
Additional power		
Output immersion heater	kW	8.0 (factory setting 5.3)
Electrical data		
Rated voltage	V	230 V 1N~PE 50 Hz
Max operating current	A	See table page 22
Driving power circulation pump	W	5-45
Driving power exhaust air fan	W	25-140
Driving power supply air fan	W	25-140
Fuse	A	See table page 22
Enclosure class		IP 21
Refrigerant circuit		
Type of refrigerant		R290, propane
Volume	kg	0.440
Cut-out value pressostat HP	MPa/bar	2.45/24.5
Cut-out value pressostat LP	MPa/bar	0.15/1.5
Heating medium circuit		
Max pressure in boiler section	MPa/bar	0.25/2.5
Max temperature (flow line)	°C	70 (factory setting 60)
Ventilation		
Min air flow at exhaust air temperature at least 20 °C	l/s	28
Min air flow at exhaust air temperature below 20 °C	l/s	31
Sound power level according to EN 12 102		
Sound power level ($L_{W(A)}$)[4]	dB(A)	51.5-54.5
Sound pressure levels		
Sound pressure level in the boiler house ($L_{P(A)}$)[5]	dB(A)	47.5-50.5
Pipe connections		
Heating medium ext Ø	mm	22
Hot water ext Ø	mm	22
Cold water ext Ø	mm	22
Docking ext Ø	mm	22
Ventilation Ø	mm	125

Miscellaneous		
Water heater		
Volume total	litre	240
Volume boiler section	litre	70
Volume, hot water heater	litre	170
Max pressure in hot water heater	MPa/bar	1.0/10
Corrosion protection		Stainless steel
Capacity hot water heating according to EN 255-3[6]		
Tap volume 40 °C at Normal comfort (V_{max})	litre	281
COP at Normal comfort (COP_t)		2.8
Idle loss at Normal comfort (P_{es})	W	54
Heating time from 15 °C to 60 °C	hh:mm	1:26
Reheating time to 60 °C, 70% of total volume	min.	57
Dimensions and weight		
Width	mm	600
Depth	mm	616
Height	mm	2100-2125
Required ceiling height	mm	2270
Weight	kg	218
Part No.		066 053

[1]A20(12)W35, exhaust air flow 200 m^3/h

[2]A20(12)W45, exhaust air flow 150 m^3/h

[3]A20(12)W55, exhaust air flow 110 m^3/h

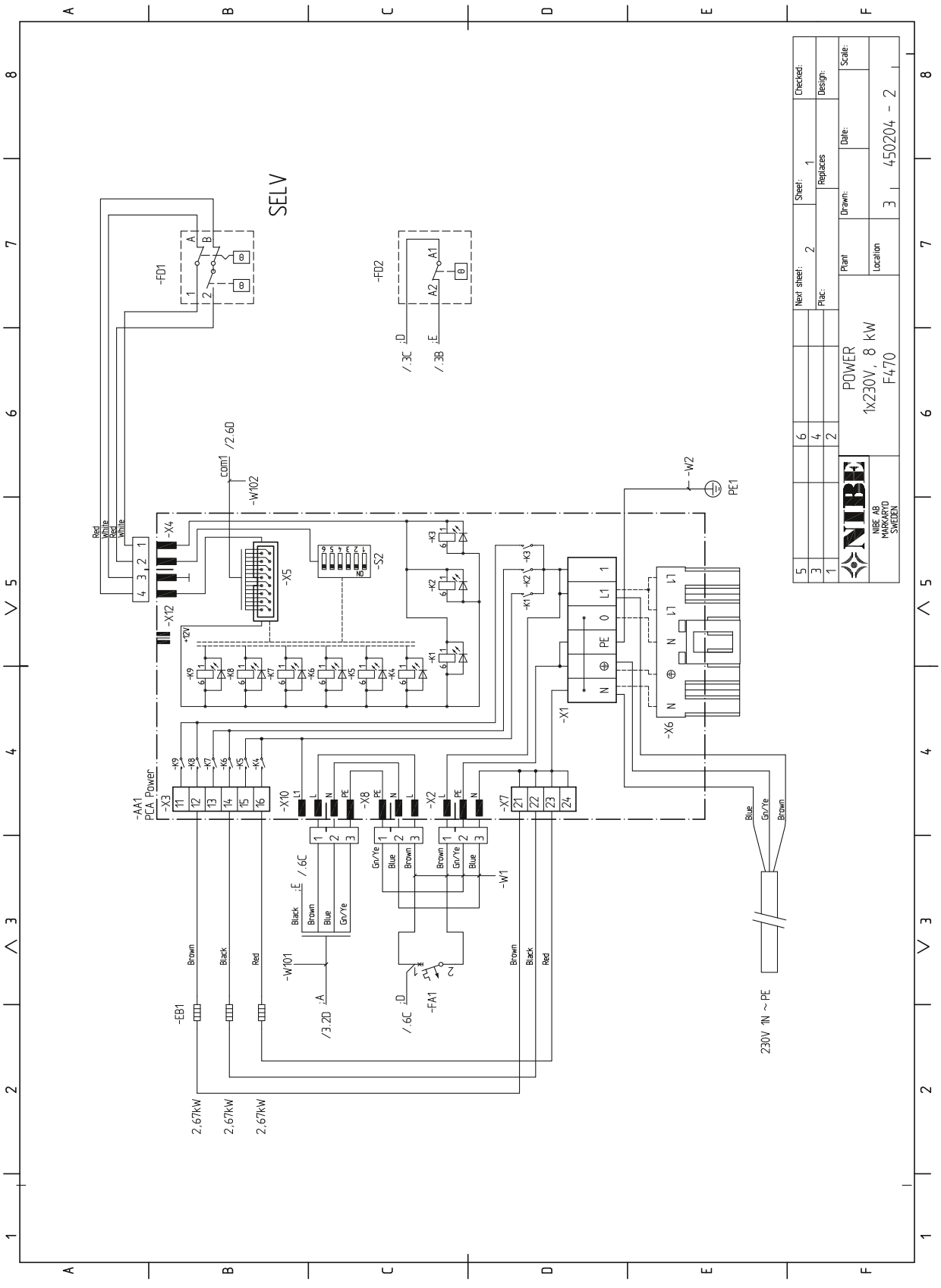
[4]The value varies with the selected fan curve. For more extensive sound data including sound to channels visit www.nibe.eu..

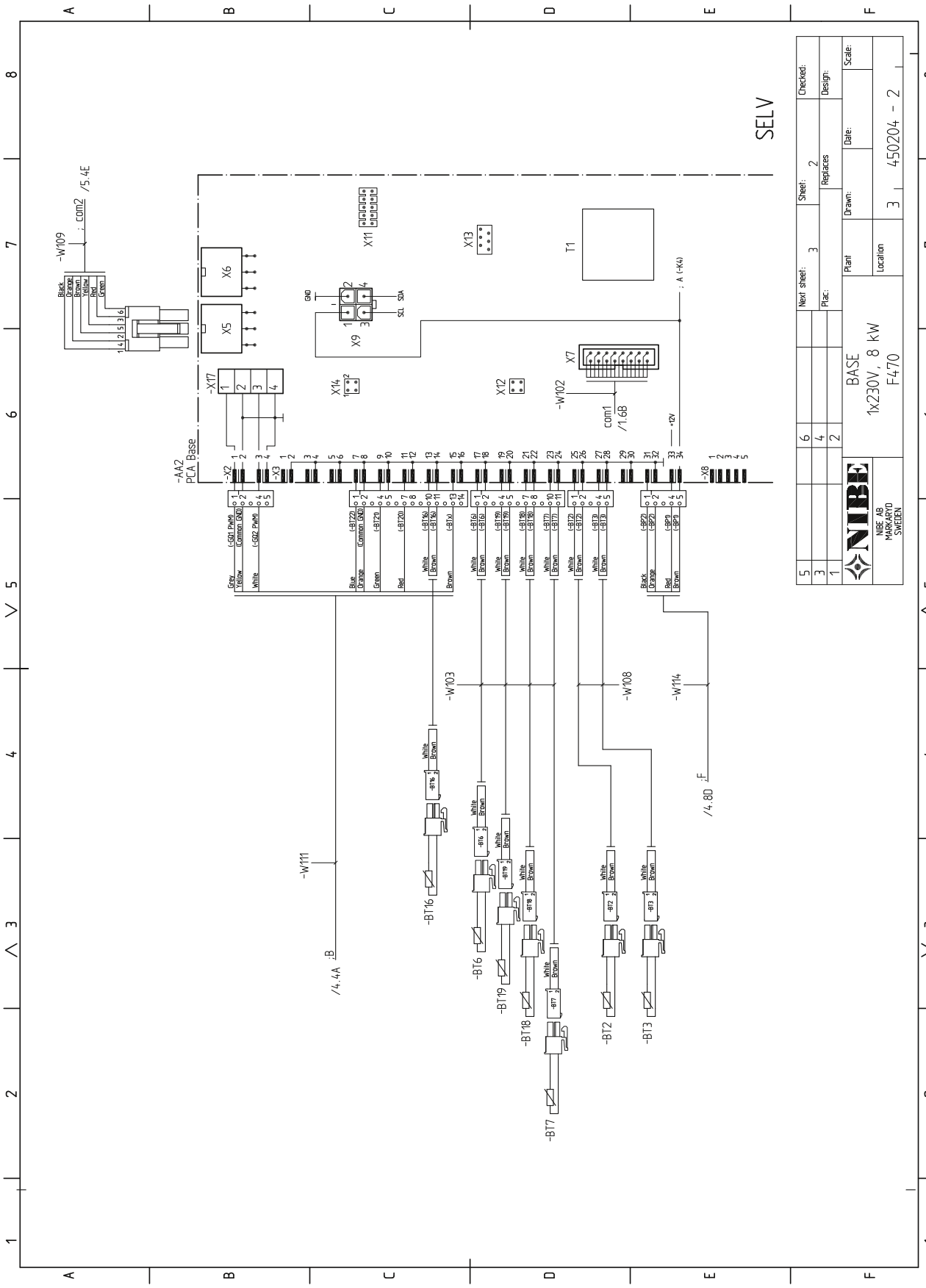
[5]The value can vary with the room's damping capacity. These values apply with a damping of 4 dB.

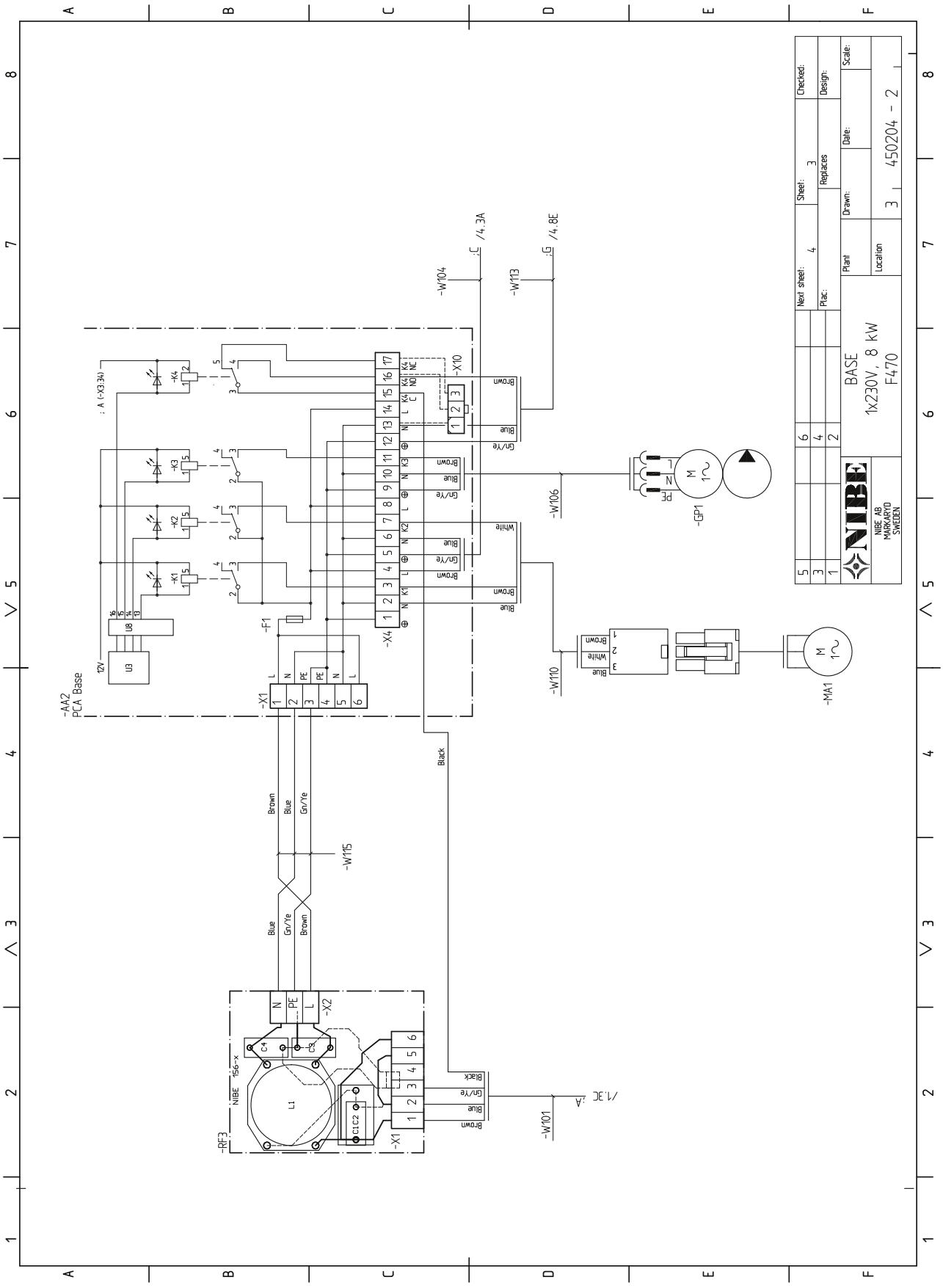
[6]A20(12) exhaust air flow150 m^3/h

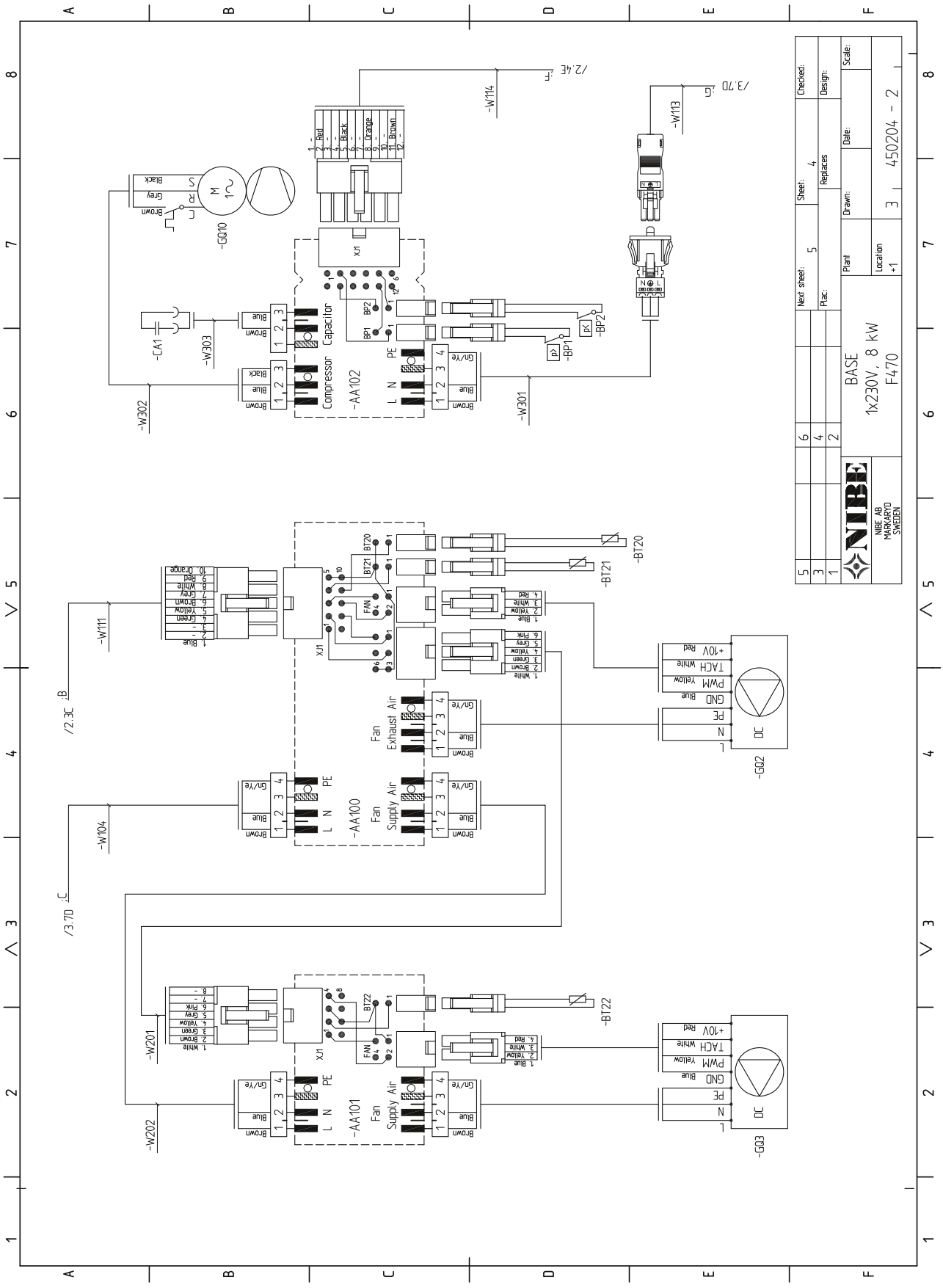
Electrical circuit diagram

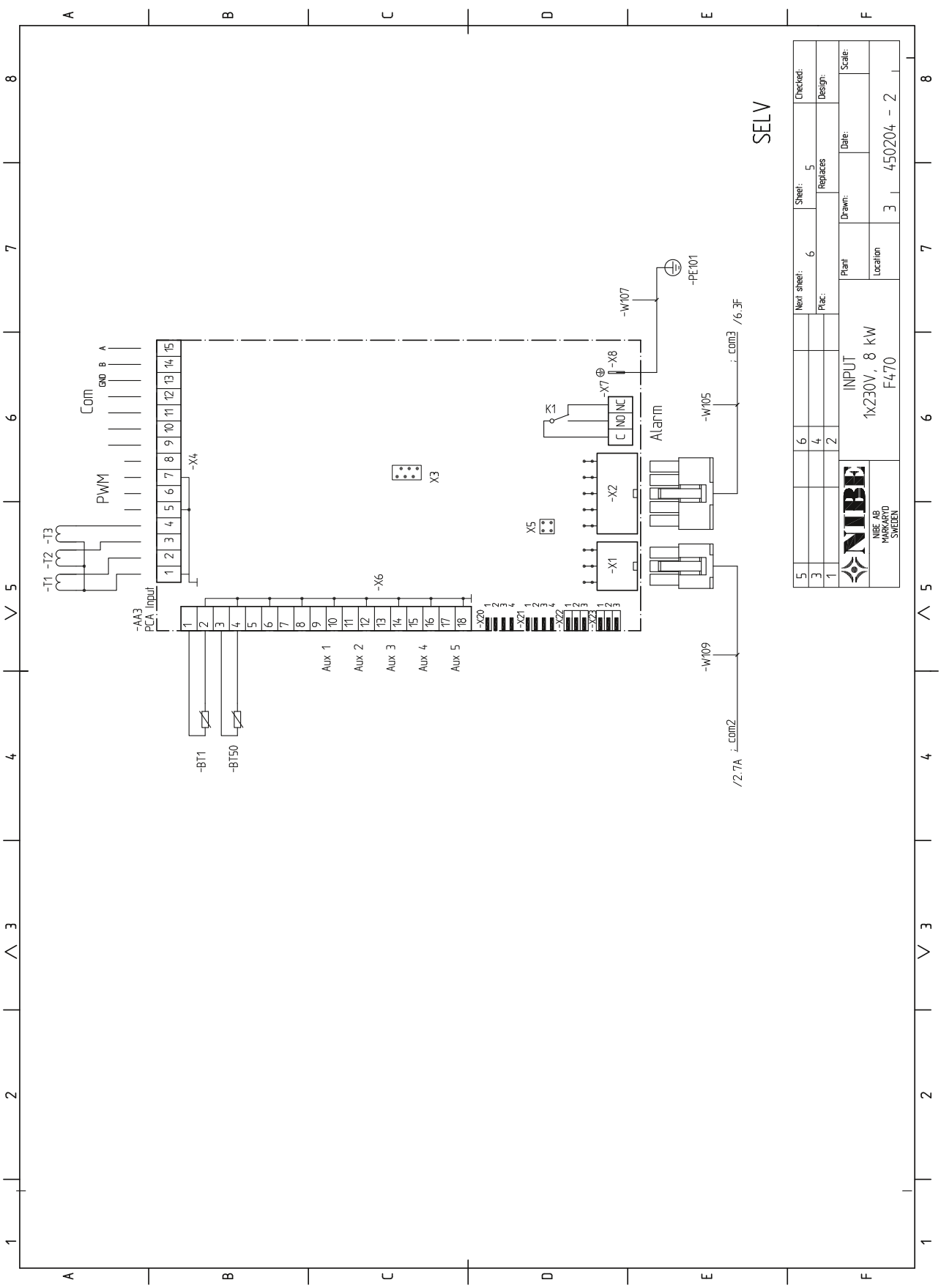
1x230V

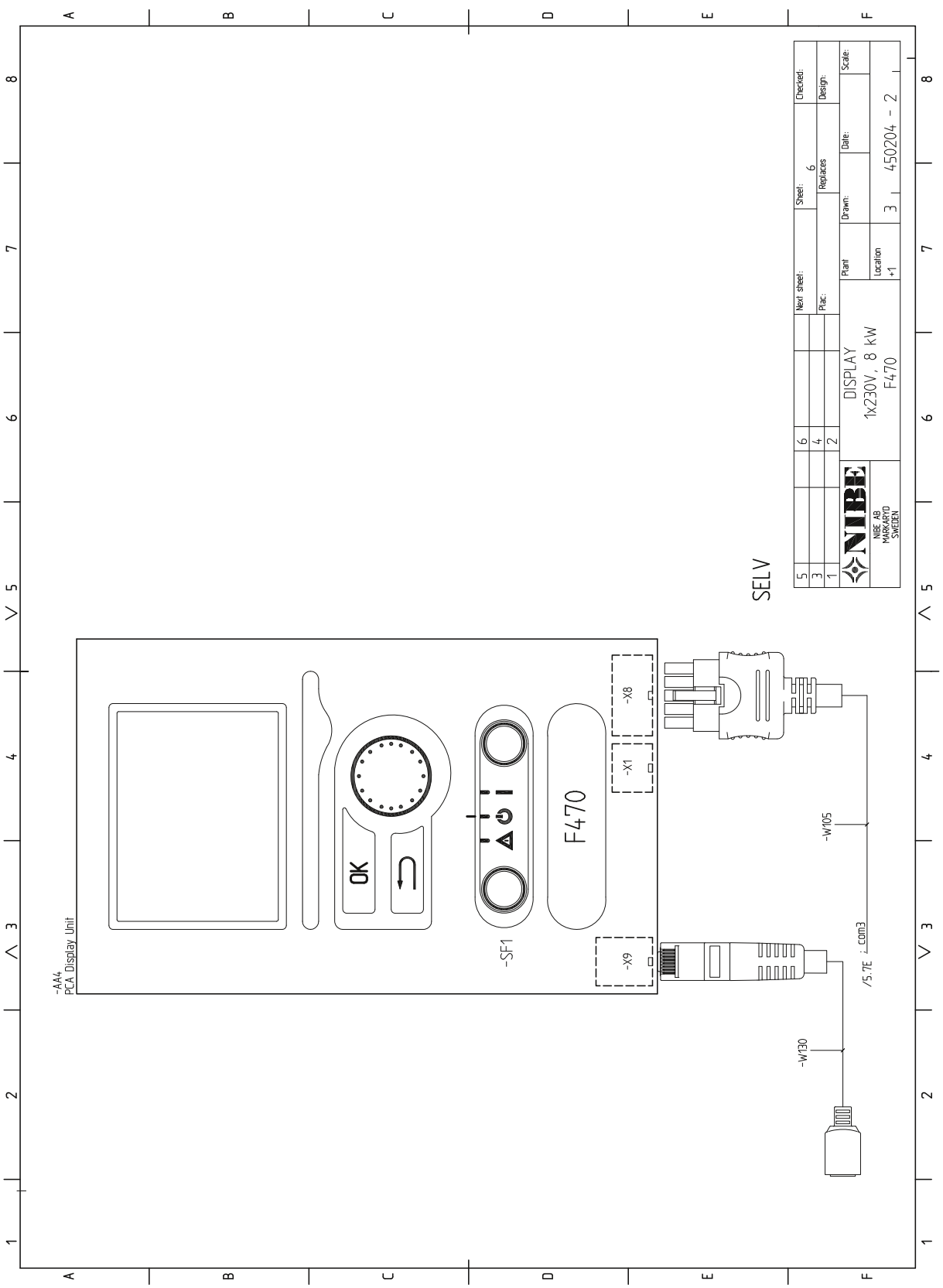



SELV
BASE
1x230V, 8 kW
F470
NIBE AB
MARKARYD
SWEDEN
450204 - 2
-AA2
PCA Base
-X2
-X3
-X8
-X17
X5
X6
X7
X9
X11
X12
X13
X14
T1
-W102
-W103
-W108
-W109
-W111
-W114
-BT2
-BT3
-BT6
-BT7
-BT16
-BT18
-BT19
com2 /5.4E
com1 /1.6B
/4.4A :B
/4.8D :F
+12V
GND
SCL
SDA
Black
Orange
Brown
Yellow
Red
Green
White
Grey
Blue
Common GND
-GP1 PWM
-GP2 PWM
-BT20
-BT21
-BT16
-BT17
-BT18
-BT19
-BT6
-BT7
-BT2
-BT3
-GP1
-GP2


-AA2
PCA Base
-X1
-X2
-X4
-X10
-F1
-K1
-K2
-K3
-K4
-RF3
-W101
-W104
-W106
-W110
-W113
-W115
-GP1
-MA1
BASE
1x230V, 8 kW
F470
NIBE AB
MARKARYD
SWEDEN
Next sheet: 4
Sheet: 3
Replaces
Plant
Location
Drawn:
Date:
Checked:
Design:
Scale:
3 450204 - 2


BASE
1x230V, 8 kW
F470
NIBE AB
MARKARYD
SWEDEN
450204 - 2
-AA102
-AA100
-AA101
-GQ10
-GQ02
-GQ03
-CA1
-W301
-W302
-W303
-W104
-W111
-W113
-W114
-W201
-W202
-BT20
-BT21
-BT22
-BP1
-BP2
Compressor
Capacitor
Fan
Exhaust Air
Supply Air
Red
Orange
Black
Brown
Grey
Blue
White
Yellow
Green
Pink
GND
PWM
TACH
+10V


SELV
INPUT
1x230V, 8 kW
F470
NIBE AB
MARKARYD
SWEDEN
450204 - 2
-AA3
PCA: Input
-X4
-X6
-X1
-X2
-X7
-X8
-X20
-X21
-X22
-X23
X3
X5
K1
C NO NC
Alarm
-PE101
-W107
-W105
-W109
; com3
/6.3F
; com2
/2.7A
-BT1
-BT50
-T1 -T2 -T3
PWM
Com
GND B A
Aux 1
Aux 2
Aux 3
Aux 4
Aux 5
Next sheet: 6
Plac:
Replaces
Plant
Location
Drawn:
Date:
Checked:
Design:
Scale:
Sheet: 5


SELV
DISPLAY
1x230V, 8 kW
F470
NIBE AB
MARKARYD
SWEDEN
Checked:
Design:
Scale:
Date:
Drawn:
Plant
Location
+1
Sheet: 6
Replaces
Next sheet:
Plac:
3 450204 - 2
-AA4
PCA Display Unit
-X8
-X1
-X9
-SF1
F470
OK
-W105
-W130
/5.7E : com3

13 Item register

Item register

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EXHAUST AIR HEAT PUMP COMMISSIONING CHECKLIST

This Commissioning Checklist is to be completed in full by the competent person who commissioned the heat pump and associated equipment as a means of demonstrating compliance with the appropriate Building Regulations and then handed to the customer to keep for future reference.

Failure to install and commission this equipment to the manufacturer's instructions may invalidate the warranty but does not affect statutory rights.

Customer Name

Address

Telephone Number

Heat Pump Make and Model

Heat Pump Serial Number

Commissioned by *(print name)*

Certified Operative Reg. No. [1]

Company Name & Address

Commissioning Date

Telephone No.

Building Regulations Notification Number *(if applicable)* [2]

CONTROLS - SYSTEM AND HEAT PUMP *Tick the appropriate boxes if applicable*

1. Time & Temperature Control to Heating	Room Thermostat & Programmer/Timer	☐	Programmable Roomstat	☐	Load/Weather Compensation	☐	Optimum Start Control ☐
2. Time & Temperature Control to Hot Water					Cylinder Thermostat & Programmer/Timer	☐	Combined with Heat pump main controls ☐
3. Heating Zone Valves					Fitted	☐	Not Required ☐
4. Hot Water Zone Valves					Fitted	☐	Not Required ☐
5. Thermostatic Radiator Valves					Fitted	☐	Not Required ☐
6. Heat Pump Safety Interlock [3]						☐	Provided ☐
7. Outdoor Sensor					Fitted	☐	Not Required ☐
8. Automatic Bypass System					Fitted	☐	Not Required ☐
9. Buffer Vessel Fitted					Yes ☐	No ☐	If YES, Volume ☐ Litres

ALL SYSTEMS

The heating system has been filled and pressure tested	Yes ☐
Expansion vessel for heating is sized, fitted & charged in accordance with manufacturer's instructions	Yes ☐
The heat pump is fitted on a solid/stable surface capable of taking its weight	Yes ☐
The system has been flushed and cleaned in accordance with BS7593 and heat pump manufacturer's instructions	Yes ☐
What system cleaner was used?	
What inhibitor was used?	Qty ☐ litres
Are all external pipeworks insulated?	Yes ☐
Is the system adequately frost protected?	Yes ☐

VENTILATION SYSTEM

Duct work fitted and pressure tested in accordance with manufacturer's instructions	Yes ☐	No ☐
Air Vents fitted	Yes ☐	N/A ☐
Ventilation air flow measured/recorded in accordance with building regulations & manufacturers instructions	Yes ☐	l/s ☐
Air filter cleaned & correctly fitted	Yes ☐	

CENTRAL HEATING MODE

Heating Flow Temperature ☐ °C Heating Return Temperature ☐ °C

DOMESTIC HOT WATER MODE

Is the heat pump connected to a hot water cylinder? ☐ Unvented ☐ Vented ☐ Thermal Store ☐ Not Connected

Hot water has been checked at all outlets Yes ☐

ADDITIONAL SYSTEM INFORMATON

Additional heat sources connected

☐ Gas Boiler ☐ Oil Boiler ☐ Electric Heater Other

ALL INSTALLATIONS

The heating, hot water and ventilation systems complies with the appropriate Building Regulations	Yes ☐
All electrical work complies with the appropriate Regulations	Yes ☐
The heat pump and associated products have been installed and commissioned in accordance with the manufacturer's instructions	Yes ☐
The operation of the heat pump and system controls have been demonstrated to the customer	Yes ☐
The manufacturer's literature, including Benchmark Checklist and Service Record, has been explained and left with the customer	Yes ☐

Commissioning Engineer's Signature

Customer's Signature

(To confirm demonstration of equipment and receipt of appliance instructions)

Notes: [1] Installers should be members of an appropriate Competent Persons Scheme. [2] All installations in England and Wales must be notified to Local Area Building Control (LABC) either directly or through a Competent Persons Scheme. A Building Regulations Compliance Certificate will then be issued to the customer. [3] May be required for systems covered by G3 Regulations

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MAINS PRESSURE HOT WATER STORAGE SYSTEM COMMISSIONING CHECKLIST

This Commissioning Checklist is to be completed in full by the competent person who commissioned the storage system as a means of demonstrating compliance with the appropriate Building Regulations and then handed to the customer to keep for future reference.

Failure to install and commission this equipment to the manufacturer's instructions may invalidate the warranty but does not affect statutory rights.

Customer Name _____ Telephone Number _____

Address _____

Cylinder Make and Model _____

Cylinder Serial Number | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Commissioned by *(print name)* _____ Registered Operative ID Number _____

Company Name _____ Telephone Number _____

Company Address _____

_____ Commissioning Date _____

To be completed by the customer on receipt of a Building Regulations Compliance Certificate*:

Building Regulations Notification Number *(if applicable)* _____

ALL SYSTEMS PRIMARY SETTINGS (indirect heating only)

Is the primary circuit a sealed or open vented system?	Sealed ☐	Open ☐	
What is the maximum primary flow temperature?			°C

ALL SYSTEMS

What is the incoming static cold water pressure at the inlet to the system?				bar
Has a strainer been cleaned of installation debris (if fitted)?	Yes ☐	No ☐		
Is the installation in a hard water area (above 200ppm)?	Yes ☐	No ☐		
If yes, has a water scale reducer been fitted?	Yes ☐	No ☐		
What type of scale reducer has been fitted?				
What is the hot water thermostat set temperature?				°C
What is the maximum hot water flow rate at set thermostat temperature (measured at high flow outlet)?				l/min
Time and temperature controls have been fitted in compliance with Part L of the Building Regulations?			Yes ☐	
Type of control system (if applicable)	Y Plan ☐	S Plan ☐	Other ☐	
Is the cylinder solar (or other renewable) compatible?	Yes ☐	No ☐		
What is the hot water temperature at the nearest outlet?				°C
All appropriate pipes have been insulated up to 1 metre or the point where they become concealed			Yes ☐	

UNVENTED SYSTEMS ONLY

Where is the pressure reducing valve situated (if fitted)?				
What is the pressure reducing valve setting?				bar
Has a combined temperature and pressure relief valve and expansion valve been fitted and discharge tested?	Yes ☐	No ☐		
The tundish and discharge pipework have been connected and terminated to Part G of the Building Regulations			Yes ☐	
Are all energy sources fitted with a cut out device?	Yes ☐	No ☐		
Has the expansion vessel or internal air space been checked?	Yes ☐	No ☐		

THERMAL STORES ONLY

What store temperature is achievable?		°C
What is the maximum hot water temperature?		°C

ALL INSTALLATIONS

The hot water system complies with the appropriate Building Regulations	Yes ☐
The system has been installed and commissioned in accordance with the manufacturer's instructions	Yes ☐
The system controls have been demonstrated to and understood by the customer	Yes ☐
The manufacturer's literature, including Benchmark Checklist and Service Record, has been explained and left with the customer	Yes ☐

Commissioning Engineer's Signature _____

Customer's Signature _____

(To confirm satisfactory demonstration and receipt of manufacturer's literature)

*All installations in England and Wales must be notified to Local Authority Building Control (LABC) either directly or through a Competent Persons Scheme. A Building Regulations Compliance Certificate will then be issued to the customer.

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Service Record

It is recommended that your heating system is serviced regularly and that the appropriate Service Interval Record is completed.

Service Provider
Before completing the appropriate Service Interval Record below, please ensure you have carried out the service as described in the manufacturer's instructions.

Always use the manufacturer's specified spare part when replacing controls.

Service 1 Date:
Engineer Name:
Company Name:
Telephone No.
Operative ID No.
Comments:

Signature:

Service 2 Date:
Engineer Name:
Company Name:
Telephone No.
Operative ID No.
Comments:

Signature:

Service 3 Date:
Engineer Name:
Company Name:
Telephone No.
Operative ID No.
Comments:

Signature:

Service 4 Date:
Engineer Name:
Company Name:
Telephone No.
Operative ID No.
Comments:

Signature:

Service 5 Date:
Engineer Name:
Company Name:
Telephone No.
Operative ID No.
Comments:

Signature:

Service 6 Date:
Engineer Name:
Company Name:
Telephone No.
Operative ID No.
Comments:

Signature:

Service 7 Date:
Engineer Name:
Company Name:
Telephone No.
Operative ID No.
Comments:

Signature:

Service 8 Date:
Engineer Name:
Company Name:
Telephone No.
Operative ID No.
Comments:

Signature:

Service 9 Date:
Engineer Name:
Company Name:
Telephone No.
Operative ID No.
Comments:

Signature:

Service 10 Date:
Engineer Name:
Company Name:
Telephone No.
Operative ID No.
Comments:

Signature:

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